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GENERAL AND
INDUSTRIAL
MANAGEMENT

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GENERAL AND INDUSTRIAL MANAGEMENT

BY
HENRI FAYOL

Translated from the French Edition (Dunod)

BY
CONSTANCE STORRS

B.A. (London), A.M.I.I.A.
Diploma in Education (Cantab.)

WITH A FOREWORD BY

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O.B.E., M.C., M.A., F.I.I.A.



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FOREWORD

By L. URWICK, O.B.E., M.C., M.A.

SIR ISAAC PITMAN & SONS, Ltd., are to be congratulated on their decision to issue this new English translation of Henri Fayol's famous work, *Administration industrielle et générale*. It first appeared in French in 1916 in the third issue for that year of the Bulletin of the Société de l'Industrie Minérale. It was no sudden exposition of administrative theory. It was the fruit of long study and experience. Fayol had already indicated the direction in which his mind was moving in two previous papers, one delivered to the Congrès international des Mines et de la Metallurgie in 1900, and the second a lecture entitled "Discourse on the General Principles of Administration," given at the Silver Jubilee Congress of the Société de l'Industrie Minérale in 1908. But for the outbreak of the war of 1914-18 his considered summary of his views on administration would have been delivered two years earlier.

The demand for it was immediate and persistent. The Société de l'Industrie Minérale issued a first reprint of 2,000 copies. This was quickly exhausted and was followed by others. By 1925 15,000 copies had been printed. In this year Dunod Frères of Paris republished the monograph in book form.

The first edition in English was issued in 1929. Mr. J. A. Coubrough, of The British Xylonite Co., Ltd., undertook the work of translation voluntarily. The book was printed in International standard format by the International Management Institute at Geneva. A few hundred copies were made available to Sir Isaac Pitman & Sons, Ltd., for distribution in Great Britain.

No English translation was published in the United States of America, despite the widespread interest in management in that country. As far as is known, the only work of Fayol's which has so far appeared in English in the U.S.A. was Miss Sarah Greer's translation of his paper, "The Administrative Theory in the State," delivered before the Second International

Congress of Administrative Science at Brussels in 1923. This appeared in 1937 as part of the collection entitled, *Papers in the Science of Administration*, edited by Luther Gulick and L. Urwick, and published by the Columbia University Press. Possibly the issue of this new English translation will serve to correct this apparent lack of balance in the appreciation in the United States of the work of the greatest of the European pioneers of management.

Henri Fayol was born in 1841 of a family of the French *petite bourgeoisie*. At fifteen he went to the Lycée at Lyon, where he spent two years. From there he passed to the National School of Mines at St. Étienne: aged seventeen, he was the youngest student of his year. At nineteen he graduated as a mining engineer. He was appointed as engineer to the Commentry group of pits of the Commentry-Fourchambault Company in 1860. With this undertaking he remained throughout his long and distinguished business career. He retired from the position of Managing Director in 1918. He remained a Director of the Company until his death in December, 1925, at the age of eighty-four. In the July before his death the Old Students' Association of the National School of Mines, of which he was President of Honour, gave a banquet in Paris to celebrate the sixty-fifth anniversary of his graduation.

As will be seen from the appended Table summarizing the various positions he held and his principal publications, his working life fell into four periods.

(i) From 1860 to 1872 he was, while an executive, still a subordinate. His intellectual effort was largely directed to problems of mining engineering, notably the question of overcoming the fire hazards of coal mining.

(ii) From 1872 to 1888 he had a larger responsibility as Director of a group of pits. His mind turned to the geological problems of the area, and the factors which would determine the life of the various pits for which he was responsible. These studies led to his famous geological monograph on the Commentry coal measure embodying his theory of deltas which appeared in three volumes between 1886 and 1893.

(iii) From 1888 to 1918 he was Managing Director (Directeur Général) of the combine, which under his leadership became Commentry-Fourchambault-Décazeville, popularly

known as Comambault. During this period he did very little writing, the two publications in 1900 and 1908, already mentioned, being the only forerunners of this book. He had a great practical responsibility to discharge. And it is characteristic of the man that he never for a moment allowed his immense range of intellectual interest or the many honorific posts which were offered him to deflect him from his main task. He consistently refused to accept any position unless it was either intimately linked with his duties as Managing Director of Comambault, or wholly disinterested.

The success with which he carried out those duties is one of the romances of French industrial history. When he was appointed its chief executive in 1888, Commentry-Fourchambault was going rapidly downhill and was on the verge of bankruptcy. No dividend had been paid since 1885. Its metallurgical works of Fourchambault and Montluçon were making heavy losses: its coal measures at Commentry and Montvicq were nearing exhaustion. From the day he took charge the tide turned. The only works which had to be closed were Fourchambault. Montluçon was kept in action, the only surviving blast furnace in Central France. Imphy rapidly attained a leading position as a producer of special steels. The approaching exhaustion of Commentry was forestalled by the purchase of the Bressac pits in 1891 and the pits and works at Décazeville in 1892. Décazeville was a difficult field, and the Company had an unfortunate history. It needed all the skill of the engineers Fayol had trained at Commentry and all his own scientific genius and practical sense to wring success from such an unpromising situation. But it was done. "Comambault" went on growing. In 1900 it extended its activities into the Eastern coal-field with the purchase of Joudreville. In the 1914-18 war this great combine rendered France inestimable service. When Fayol retired at the age of seventy-seven its financial position was unassailable and its staff of exceptional quality.

(iv) Though Fayol had retired at a ripe old age he continued active. From 1918 till 1925 he devoted himself to popularizing his Theory of Administration, the fruit of his thirty years of astounding practical success. A pen portrait of him in the last year of his life describes him as "still

young—upright, smiling, with a penetrating and direct glance. M. Fayol meets you as a friend. His natural air of authority, his kindness, his youthfulness of spirit, which makes him interested in everything, enabling him to be a past master in the art of being a grandfather (and even a great-grandfather), are both impressive and, at the same time, most attractive.”¹

In this period he undertook two main tasks. The first was the foundation of a Centre of Administrative Studies. For several years this Centre held weekly meetings attended by eminent men from the most varied professions—writers, philosophers, men of action, engineers and soldiers, officials, and industrialists. Henri Fayol presided at these meetings. A large and authoritative literature developed from them. As early as 1918 M. Carlioz organized a series of lectures on “Fayolisme” at the School of Higher Commercial Studies. Marshal Lyautey circulated through the French Army in Morocco 2,000 copies of a pamphlet applying Fayol’s principles to military administration. He himself was invited to give a series of lectures at the *École supérieure de la guerre*. Administrative doctrine was also taught at the Navy’s supply school.

The second was the far more difficult venture of trying to persuade government to pay some attention to principles of administration. He had no illusions as to the vastness of the task: but, he believed that it was possible. He was invited by M. Deschamps, then Under-Secretary of State in the Posts and Telegraphs, to undertake a complete investigation of this Department. His *La Reforme Administrative des Postes et Télégraphes* was published in pamphlet form in 1921. In the same year he contributed an important article to the *Révue politique et parlementaire* under the title, “The State’s Administrative Ineptitude” (“L’Incapacité Administrative de l’État—les Postes et Télégraphes”), which was republished in book form by Dunod Frères. In 1923 he took a leading part in the Second International Congress of Administrative Science held at Brussels. During the 1924 Assembly at the League of Nations he accepted an invitation

¹ *Un Grand Ingénieur—Henri Fayol*. Study published by the Students’ Association of the National School of Mines of St. Etienne, p. 5.

to address the International Federation of Universities at Geneva on the importance of the doctrine of administration as a contribution to peace. At the time of his death he was engaged in investigating the organization of the French tobacco industry—a government monopoly.

Thus his life embraced four careers rather than one, and in each of them he was pre-eminent. As a technical man he achieved national distinction for his work in mining engineering. As a geologist he propounded a completely new theory of the formation of coal-bearing strata and supported it with a detailed study of the Commeny district, almost unique as a piece of geological research. As a scientist turned industrial leader his success in both fields was phenomenal. The days of his own detailed research were over but he applied the scientific approach to problems in every direction and encouraged those associated with him to do likewise. It was at the metal works at Imphy that Mons. C. E. Guillaume did the research work which secured him a Nobel prize in 1921. His success financially has already been recorded. But he always declared that that success was not due to personal qualities, but to the steady application of certain simple principles. Finally, as a philosopher of administration and as a statesman he left a mark on the thinking of his own and of many other European countries, not less than the mark left by Frederick Winslow Taylor in the U.S.A.

In the early stages of the popularization of his work attempts were made to represent Fayol's doctrine as in some way in competition or contrast with Taylor's studies. But at the opening of the Second International Congress held at Brussels in 1925, he himself announced that he wanted to make clear how false he found this antithesis. This speech led to the unification of the organization founded by Henri le Chatelier, the "Conférence de l'Organisation Française," and Fayol's Centre of Administrative Studies, into a single national body—"Le Comité de l'Organisation Française." The work of Taylor and Fayol was, of course, essentially complementary. They both realized that the problem of personnel and its management *at all levels* is the "key" to industrial success. Both applied scientific method to this problem. That Taylor worked primarily on the operative level, from the bottom of the

industrial hierarchy upwards, while Fayol concentrated on the Managing Director and worked downwards, was merely a reflection of their very different careers. But Fayol's capacity to see and to acknowledge this publicly was an example of his intellectual integrity and generosity of spirit. They gave France a unified management body more than twenty years before the same ideal began to be realized in Great Britain.

This book contains only the first two parts of the treatise Fayol had meant to write. The third and fourth parts were never completed. Since these parts contain the analysis of his doctrine they may seem a little dry and theoretical. It was his intention to give the practical application of his principles in the projected Parts III and IV. Some suggestions of his views in this field may be found in an interview published in the *Chronique Social de France* of January, 1925. Since they throw light on his ideas as to the working out of his doctrine some paragraphs may be quoted.

The editors had asked Fayol the question, what, in his opinion, was the best method of taking a view of the organization of an undertaking and of determining what improvements were necessary? He replied—

“The best method is a study of what I have described as the administrative apparatus. If this is as it should be, it will be possible to secure precise information on the current situation and on the general progress of the undertaking. One can also ascertain immediately that forecasting and planning, organization, command, co-ordination and control are properly provided for, that is to say that the undertaking is well administered. If there are gaps in the administrative apparatus, these are often pointers to weaknesses in the organization or to faults in the running of the undertaking.

“The administrative apparatus is further a concept of very wide application. Not only is it useful to those who may have to manage or control an industrial undertaking but to my mind its absence is a fundamental weakness in our public services, and I cannot imagine a better service to our country than to ensure its application by the State. That would be the starting point for essential reforms.

“What, then, is this administrative apparatus? It is a system of recording which includes the present, the past and the future; in which the contributions made by senior members of the staff, together with information from outside sources, ensure for the Directors the best possible means of appreciating the probable consequences of their decisions.

“It must comprise: The Survey, The Plan, Reports and Statistics, Minutes of Meetings, and The Organization Chart.

"*The Survey* is concerned with each and every part of the undertaking. It shows the situation in the present, in the past, and in the probable future. The historical part of the Survey deals with the considerations that led to the formation of the undertaking, the changes that have taken place, and the results that have been achieved. The present situation is shown in full detail as to the resources and needs of the undertaking, looked at from every point of view. The probable future is arrived at by taking into account the past, the present, and the prevailing circumstances, economic, political, and social. This Survey presupposes an adaptable Chief Executive who can win loyal and enthusiastic support from subordinates, and who will carry his share of responsibility.

"From this Survey it is possible to develop a policy which is implemented in The Plan.

"*The Plan* is the synthesis of the various forecasts: annual, long term, short term, special, etc. It is a sort of picture of the future, where immediate events are shown clearly, and prospects for the future with less certainty. It gives the known facts, and those foreseen for a certain time. Everyone recognizes the necessity for a Plan but even private undertakings often neglect to prepare one, and the State rarely does so. This is because its preparation demands considerable effort from the senior members of the staff with at their head a stable Chief.

"These are the reasons for a long-term Plan, and some of the advantages which accrue—

"In an undertaking with any complexity at all it is necessary to have well thought-out directives, which indicate anticipated progress for a period of time. These directives must be based on an understanding of the undertaking, its present position and the reasons for this, and external circumstances. If decisions are made in the light of certain facts, and some of these turn out to be ill-founded, it is possible to modify the Plan accordingly.

"The Plan must receive the support of all those with authority and responsibility.

"The act of forecasting is of great benefit to all who take part in the process, and is the best means of ensuring adaptability to changing circumstances.

"The collaboration of all concerned leads to a united front, an understanding of the reasons for decisions, and a broadened outlook. It increases the value of every member of the staff: and is evidence to the Chief of their goodwill. The Plan charts the course: its general acceptance builds unity, and mutual confidence.

"*Reports and Statistics* regarding work undertaken are the complement of the Plan. Reports from subordinates to the superior officers come up right through the undertaking: they can be daily, monthly, yearly, etc. They are a powerful means of control.

"*Minutes* of Conferences of Senior Executives are a record of the weekly meetings of the various heads of departments. At these

meetings each department head explains, in turn, the results obtained in his department, and the difficulties encountered. There is then discussion, and decisions are made by the Chief. At the end of the meeting each one knows he has the most up-to-date information, and co-ordination is ensured.

"The Minutes of these Meetings are of paramount interest to the Chief Executive. They give him an insight into the minds of each member of his staff, to be secured in no other way.

"*The Organization Chart* shows at a glance the set-up of the undertaking, the services rendered, the hierarchy, how each position is filled—who reports to whom, and so on. From this Chart it is possible to discern faults in organization, dual command, functions for which no one is responsible, etc. It is a sign-post to imperfections, and indicates ways to better utilization of available personnel.

"Attached to the Chart is a definition of duties, showing individual authority and responsibility for all activities.

"These are the constituents of the administrative apparatus with which I shall deal particularly. The notion could easily be extended. To know the exact standing of the undertaking it is essential to have a detailed statement as to the personnel—those who may be expected to assume positions of authority, and those who will be retiring."

Personally, and taking the long view, I feel that it is a pity that Mrs. Storrs and Messrs. Pitman have decided to translate Fayol's word "*administration*" by "management." In the original English translation his title was translated directly, "*administration*."

Immediately there is much to be said for the course they have followed. One of the difficulties of the French language is that it has no exact equivalent for the term *management* as used in the English-speaking countries. When Le Chatelier was trying to make F. W. Taylor's ideas known to his countrymen he was driven back on to the awkward paraphrase, "*L'organisation scientifique du travail*" as a translation of "scientific management." The objection to this phrase is, of course, that "*travail*" in French has the same political flavour as *attaches* in English to the term "labour": one of the great Trade Unions in France is known as the "*Confédération Générale du Travail*." Thus the French phrase carries the suggestion that scientific management is concerned solely with the work of operatives. This is, of course, not only far from being the case, but is the exact antithesis of Taylor's philosophy. It is the additional responsibility thrown on the managers which is the core of his teaching. Much of the

difficulty encountered in Europe in securing acceptance of modern methods of industrial control has been due to the impression that they were merely a device for extracting more effort from operatives and called for no corresponding change of outlook on the part of supervisors, managers, and directors.

The activity which Fayol discusses in this book is unquestionably the activity popularly described in the English-speaking countries as *management*. And the translation of his title as "Industrial and General Management" is therefore, as at the present moment, both accurate and convenient.

On the other hand, the word *management* in the English-speaking countries is itself used very loosely and with a variety of meanings. The *Concise Oxford Dictionary* still carries the quaint definition—

"*Management*, n. In verbal senses; also or especially; trickery, deceitful contrivance; *the management*, governing body, board of directors, etc."

The close association of these ideas is unlikely to enhance the dignity either of the subject or of those who practise the activity.

If the subject is ever to be treated seriously as one in which theoretical study and the systematic arrangement of knowledge can contribute to practice, this confusion in the use of terms must be cleared up. Each word must have one meaning and one meaning only. Otherwise precise communication and effective organization of experience will prove impossible. But if the words used are to have an exact and single meaning it is imperative that the same word should not be used to describe status and function. Human beings are incapable of any objective discussion of the correct distribution of functions, if, owing to the terms used, the problem becomes confused in their minds with their status as individuals, that is to say with their personal dignity, prospects of advancement, and desire for emoluments.

This is not a theoretical difficulty. It is of urgent practical importance. For instance, the use of the term *The Management* to describe those who occupy certain positions of authority has caused in some factories in Great Britain the most embittered and embarrassing disputes as to whether foremen are

or are not part of "The Management." There is no question that such foremen, indeed supervisors of every grade, however humble, carry out *activities of management*: they manage or mismanage people. Equally there is no question that some knowledge of the *subject of management* is required for the effective discharge of their duties. But the barren controversy will continue as long as the word *management* is used not in *one* meaning, to denote a subject or an activity or a rank, but alternatively in all these different connotations.

Now it will be quite clear to all who read his text carefully that Fayol employs the word "*administration*" with *one* meaning and one meaning only. He uses it to describe a function, a kind of activity. And he is quite indifferent whether those exercising this kind of activity are described as "Managing Directors" or as "Charge-hands." He is concerned with the function, not with the status of those who exercise it. To be sure, those holding positions high up in the hierarchy will devote a larger proportion of their time to this function and a smaller proportion to other functions and vice versa (*vide* Table III). But he is quite clear that some element of *administration*, as he uses the word, enters into all tasks involving supervision of the work of others.

It seems regrettable that a term which is thus used by a high authority in the French-speaking countries in a strictly defined and logical sense and which has an exact transliteration in English should be translated by another English word which lacks this precise connotation. Moreover, if the terminology of the subject is ever to become standardized in the English-speaking countries it seems likely that the word *management* will be used, not of the activity or of the function or of those who exercise it, but as a substantive describing the subject, the body of knowledge and practice as a whole, the "discipline." There are signs that this usage is gaining ground in the United States. We find such phrases as "a government without good *management* is a house builded on sand,"¹ or, "In creating the Tennessee Valley Authority, Congress carefully adapted and wrote into law the basic principles of modern management."²

¹ F. D. Roosevelt, letter introducing to Congress the Report of the President's Committee on Administrative Management, 1937.

² David E. Lilienthal, *TVA—Democracy on the March*, p. 144.

Such a usage would find a close analogy in the evolution of the terminology of the only other practical art dealing, as does management, primarily with man, based on a range of underlying sciences and practised in the scientific temper and spirit—namely, medicine. The word *medicine* is confined, for purposes of serious discussion, to the subject, the body of knowledge and practice. It carries a secondary and popular meaning, viz., the remedy prescribed by one who practises the art—"a bottle of medicine": but, this meaning of the term is not used in technical speech or writing. When we wish to describe the activity we speak of "medical practice": those who exercise the activity are "medical practitioners" or "doctors." We do not describe them as "the medicine."

In the second place there is a tendency in the English-speaking countries to try to draw a distinction between *management*, an activity confined to conducting industrial or commercial undertakings, and *public administration*, the art of conducting undertakings concerned with the government of nations or localities. It was of the essence of Fayol's teaching that this distinction is false and misleading. He said in his address to the Second International Congress of Administrative Science—

"The meaning which I have given to the word *administration* and which has been generally adopted, broadens considerably the field of administrative science. It embraces not only the public service but enterprises of every size and description, of every form and every purpose. All undertakings require planning, organization, command, co-ordination and control, and in order to function properly, all must observe the same general principles. We are no longer confronted with several administrative sciences, but with one which can be applied equally well to public and to private affairs."¹

As has been shown, he devoted much of his effort in the concluding years of his life to demonstrating this unity of administrative theory.

In this he was at one with the most distinguished exponents of scientific management in the United States—F. W. Taylor himself, Mary Parker Follett and others. If the analogy with

¹ "The Administrative Theory in the State," in *Papers in the Science of Administration*, edited by Luther Gulick and L. Urwick, Columbia University Press, 1937.

medicine is accepted the idea of a subdivision of the field of inquiry by occupational groupings seems unrealistic. It is difficult to contemplate seriously a bio-chemistry of bankers, a physiology of professors or a psychopathology of politicians. The attempt to subdivide the study of management or administration in accordance with the purpose of particular forms of undertaking seems to many authorities, as it seemed to Fayol himself, equally misdirected.

But the force of tradition, of habit, in human affairs is obstinate and persistent. There is a well-recognized tendency among the members of established professions to imagine that their procedures are sacrosanct, beyond question, and that no lessons of utility can be drawn from the practice of other callings. It is a tendency for which the French have coined the phrase, "*déformation professionnelle*." It is almost untranslateable in English. Perhaps "occupational paralysis" comes nearest to expressing the meaning. This tendency is likely to be at its strongest where a profession has enjoyed high public esteem and has, within the limits of its former purposes, been particularly effective and therefore powerful. This tendency is directly opposed to Fayol's concept of the unity of administrative theory.

Even in the United States, where popular recognition of the importance of the subject of management is wider and deeper than in Great Britain, the attempt to develop separate principles in dealing with public administration is constantly repeated. David E. Lilienthal felt it necessary to warn his compatriots only a few years ago that "this failure to recognize the importance of principles of modern management in public affairs may bring upon us the gravest consequences in the immediate future."¹ In Great Britain the danger of delay in the development and application of knowledge owing to this professional fragmentation of the field of inquiry is much greater. The false antithesis between "business management" and "public administration" is far more widespread and cherished more tenaciously by members of both callings.

It is to be hoped that the translation of "*administration*" in Fayol's title by *management* will not lead those engaged in central and local government in the English-speaking countries,

¹ TVA—*Democracy on the March*, p. 145.

to imagine that the lessons he has to teach are only for those engaged in the conduct of business undertakings. If so, they will misread the lesson which was at the heart of his philosophy and the secret of his phenomenal success as a practical administrator.

OUTLINE OF THE CAREER AND PRINCIPAL WRITINGS OF HENRI FAYOL

| YEAR | | EVENT OR POSITION | AGE | DATE | PUBLICATIONS |
|------|------------|---|-----|------|---|
| MAIN | SUBSIDIARY | | | | |
| 1841 | | Born. Lycée de Lyon. School of Mines, St. Étienne. Appointed Engineer of the Commentry pits of the S.A. Commentry-Fourchambault. Manager of the Commentry pits. General Manager of the Commentry, Montvicq and Berry group of mines. | 15 | | TECHNICAL PUBLICATIONS ON MINING ENGINEERING <i>Articles in the Bulletin of the Société de l'Industrie Minière</i> Note on the timbering of the Commentry pits. Planning mine galleries. Note on the erection, removal and replacement of timbering. Structural changes and spontaneous combustion in coal exposed to air. Note on the elimination of night shifts in the working of large seams. Note on subsidence due to mining. |
| 1856 | | | 17 | | |
| 1858 | | | 19 | | |
| 1860 | | | 25 | | |
| 1866 | | 31 | | 1874 | |
| 1872 | | | | 1877 | SCIENTIFIC PUBLICATIONS ON THE GEOLOGY OF COAL MEASURES <i>Proceedings of the Académie des Sciences</i> Four geological studies of the Commentry coal measure. <i>Bulletin of the Société de l'Industrie Minière</i> Five issues containing the full text of a geological study of the Commentry coal field, subsequently published as a book in three volumes. <i>Bulletin of the Société géologique de France</i> Summary of the theory of deltas and history of the formation of the Commentry basin. |
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OUTLINE OF THE CAREER AND PRINCIPAL WRITINGS OF HENRI FAYOL

| YEAR | EVENT OR POSITION | | | | | AGE | DATE | PUBLICATIONS |
|------|-------------------|---|--|--|--|-----|------|--|
| | MAIN | SUBSIDIARY | | | | | | |
| 1925 | 1925 | Appointed Commander of the Order of the Crown of Roumania. Dinner of Honour given in Paris by the Old Students' Association of the National School of Mines to celebrate the sixty-fifth anniversary of his graduation. Died. | | | | | 1925 | <i>Administration, industrielle et générale.</i> Republished in book form by Dunod Frères. Publication of <i>Un grand ingénieur—Henri Fayol</i> by Henri Verney, a study celebrating the sixty-fifth anniversary of his graduation. |
| | | ACADEMIC HONOURS | | | | | 1929 | First English translation of <i>Administration, industrielle et générale</i> by the International Management Institute, Geneva. |
| | | Delesse Prize of the Academy of Sciences. Gold medal of the Société d'encouragement pour l'Industrie nationale. | | | | | 1937 | English translation of "The Theory of Administration in the State," published in the U.S.A. in <i>Papers in the Science of Administration</i> . |
| | | Gold medal and medal of honour of the Société de l'Industrie Minérale. | | | | | 1945 | Short account of the life and work of Henri Fayol, published in Great Britain in <i>The Making of Scientific Management</i> , Vol. 1, "Thirteen Pioneers," by L. Urwick and E. F. L. Brech. |

PREFACE

USELESS

MANAGEMENT plays a very important part in the government of undertakings: of all undertakings, large or small, industrial, commercial, political, religious or any other. I intend to set forth my ideas here on the way in which that part should be played. My work will be divided into four parts:

Part I. Necessity and possibility of teaching management.

Part II. Principles and elements of management.

Part III. Personal observations and experience.

Part IV. Lessons of the war.

The first two parts which are to be the subject of the present volume are the development of the lecture which I delivered at the fiftieth anniversary of the Association of Mining Industry of Saint Étienne in 1908. The third and fourth parts will be the subject of a second volume to appear shortly.

H. FAYOL

[Note.—Parts III and IV were never published.]

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PART I
NECESSITY AND POSSIBILITY
OF TEACHING MANAGEMENT

CHAPTER I

DEFINITION OF MANAGEMENT

ALL activities to which industrial undertakings give rise can be divided into the following six groups—

1. Technical activities (production, manufacture, adaptation).
2. Commercial activities (buying, selling, exchange).
3. Financial activities (search for and optimum use of capital).
4. Security activities (protection of property and persons).
5. Accounting activities (stocktaking, balance sheet, costs, statistics).
6. Managerial activities (planning, organization, command, co-ordination, control).

Be the undertaking simple or complex, big or small, these six groups of activities or essential functions are always present. The first five are well known—a few words will be enough to demarcate their respective spheres—but the managerial group calls for further explanation.

1. Technical Activities

The number, variety and importance of technical activities, the fact that products of every kind (material, intellectual, moral) originate with technical men, the almost exclusively vocational teaching of our technical schools, the openings available to technical men—all these contribute to make the technical function, and in consequence technical ability, stand out from and overshadow other abilities that are just as necessary for, and sometimes more conducive to, the progress and prosperity of businesses. Nevertheless the technical function is not always the most important. Even in industrial undertakings there are circumstances where some one of the other functions may exercise a much greater influence over the running of the business than does the technical one. It must not be lost sight of that the six essential functions are closely interdependent—the technical function, for instance, cannot

exist without raw materials, sales outlets, capital, security, foresight.

2. Commercial Activities

The prosperity of an industrial concern often depends as much on the commercial as on the technical function. For the product not to sell means ruin. Knowledge of buying and selling is just as important as knowledge of efficient production. Commercial ability includes, together with acumen and decision, a thorough knowledge of the market and of the strength of competitors, long-term foresight and, to an increasing extent in large-scale concerns, the use of contracts.

Finally, when products pass from one section to another, within the same concern, the commercial function must see to it that prices determined by higher authority (termed "regulation" price) do not give rise to dangerous illusions.

3. Financial Activities

Nothing is done without this function entering into it. Capital is required for personnel, plant, tools, raw materials, dividends, development, reserves, etc. Shrewd financial management is necessary to obtain capital, to make optimum use of available funds, to avoid foolhardy commitments. Many potentially prosperous enterprises die suffering from lack of money. Nor is any reform or improvement possible without finances or credit. An essential condition of success is to keep constant watch over the financial position of the business.

4. Security Activities

The object of this group is to safeguard property and persons against theft, fire and flood, to ward off strikes and felonies and broadly all social disturbances liable to endanger the progress and even the life of the business. It is the master's eye, the watch-dog of the one-man business, the police or army in the case of the State. It is, generally speaking, all measures conferring security upon the undertaking and requisite peace of mind upon the personnel.

5. Accounting Activities

This group is the visual organ of businesses. It must throw up at any given moment, present position and future trend, must afford accurate, clear and precise information about the economic position of the concern. An efficient accounting system, clear and simple, giving an accurate idea of the firm's condition is a powerful managerial instrument. For this group of activities, as for the others, some training is essential and the indifference with which it is treated in the large training establishments for industry shows that the services rendered by it are not appreciated.

6. Managerial Activities

No one of the preceding groups is concerned with drawing up the broad plan of operations of the business, with assembling personnel, co-ordinating and harmonizing effort and activity. These functions do not come within the province of technical activity nor within the commercial, financial, security, or accounting group. They make up another group usually indicated by the term Management with somewhat ill-defined attributes and frontiers. Foresight, organization, co-ordination and control undoubtedly form part of management as it is commonly understood. Should command necessarily be included? It is not obligatory: command may be treated separately. Nevertheless I have decided to include it under management for the following reasons—

1. Selection and training of personnel and the setting up of the organization which are managerial responsibilities are very much concerned with command.

2. Most principles of command are principles of management—management and command are very closely linked. From the mere standpoint of facilitating study there would be reason to set these two groups together.

3. Furthermore, the grouping has the advantage that it makes management a very important function at least as worthy as the technical one of attracting and holding public attention.

Therefore I have adopted the following definition: To

manage is to forecast and plan, to organize, to command, to co-ordinate and to control. To foresee and provide means examining the future and drawing up the plan of action. To organize means building up the dual structure, material and human, of the undertaking. To command means maintaining activity among the personnel. To co-ordinate means binding together, unifying and harmonizing all activity and effort. To control means seeing that everything occurs in conformity with established rule and expressed command.

Management, thus understood, is neither an exclusive privilege nor a particular responsibility of the head or senior members of the business; it is an activity spread, like all other activities, between head and members of the body corporate. The managerial function is quite distinct from the other five essential functions. It should not be confused with government. To govern is to conduct the undertaking towards its objective by seeking to derive optimum advantage from all available resources and to assure the smooth working of the six essential functions. Management is merely one of the six functions whose smooth working government has to ensure, but it has such a large place in the part played by higher managers that sometimes this part seems exclusively managerial.

CHAPTER II

RELATIVE IMPORTANCE OF THE VARIOUS ABILITIES WHICH CONSTITUTE THE VALUE OF PERSONNEL OF CONCERNS

To every group of activities or essential functions there exists a corresponding special ability. There can be identified technical ability, commercial ability, financial ability, managerial ability, etc. Each of these is based on a combination of qualities and of knowledge which may thus be summarized—

1. Physical qualities: health, vigour, address.
2. Mental qualities: ability to understand and learn, judgment, mental vigour and adaptability.
3. Moral qualities: energy, firmness, willingness to accept responsibility, initiative, loyalty, tact, dignity.
4. General education: general acquaintance with matters not belonging exclusively to the function performed.
5. Special knowledge: that peculiar to the function, be it technical, commercial, financial, managerial, etc. *long*
6. Experience: knowledge arising from the work *proper*. It is the recollection of lessons which one has *oneself* derived from things.

Such is the sum total of the qualities and knowledge which go to make up any of the essential abilities; it includes physical, mental and moral characteristics, general education, experience, and a certain specific knowledge of the function in question. The importance of each of the elements going to make up the ability is commensurate with the nature and importance of the function. In the one-man business, where all functions are carried out by one person, the span of essential abilities is, of necessity, smaller. In the large undertaking, where various important activities are carried out, the personnel must possess numerous abilities of a high order, but as the functions are spread over numerous employees, each of these employees is generally only required to possess the sum total in limited fashion.

Although this subject lends itself ill to numerical assessment,

I have attempted to set a numerical value to the relative importance of each ability in the evaluation of employees and heads of businesses. In Table I, I have compared the essential abilities of different employees of the technical function of a

TABLE I
RELATIVE IMPORTANCE OF REQUISITE ABILITIES OF PERSONNEL IN
INDUSTRIAL CONCERNS
Personnel of the Technical Function of a Large Concern

| CLASS OF EMPLOYEE | REQUISITE ABILITIES | | | | | | |
|-------------------------------------|----------------------|---------------------|----------------------|---------------------|--------------------|---------------------------|-------------------------------|
| | Man- agerial % | Tech- nical % | Com- mercial % | Finan- cial % | Secur- ity % | Ac- count- ing % | Total Evalu- ation % |
| <i>Large Establish- ments</i> | | | | | | | |
| Workman | 5 | 85 | — | — | 5 | 5 | 100 (a) |
| Foreman | 15 | 60 | 5 | — | 10 | 10 | 100 (b) |
| Superinten- dent | 25 | 45 | 5 | — | 10 | 15 | 100 (c) |
| Head of Sec- tion | 30 | 30 | 5 | 5 | 10 | 20 | 100 (d) |
| Head of Tech- nical Dept. | 35 | 30 | 10 | 5 | 10 | 10 | 100 (e) |
| Manager | 40 | 15 | 15 | 10 | 10 | 10 | 100 (f) |
| <i>Several Estab- lishments</i> | | | | | | | |
| General Man- ager | 50 | 10 | 10 | 10 | 10 | 10 | 100 (g) |
| <i>State Enter- prise</i> | | | | | | | |
| Minister | 50 | 10 | 10 | 10 | 10 | 10 | 100 (h) |
| Head of State | 60 | 8 | 8 | 8 | 8 | 8 | 100 (i) |

large industrial concern. In Table II, I have compared the essential abilities of the different heads of industrial concerns of all sizes. Then, having established that conclusions drawn from Table I apply to employees of all functions of the industrial concern and that those drawn from Table II apply to heads of undertakings of any kind, I came to the following general conclusions: In businesses of all kinds the essential ability of the lower ranks is the technical ability characteristic of the business and the essential ability of the higher ranks is managerial ability.

Table I. Relative importance of the requisite abilities for personnel of the technical function of a large concern.

This personnel makes up the following scalar chain: workers, foremen, superintendents, sectional heads, departmental heads, manager. If the concern embraces several large separate establishments, the chain continues up to general manager; and if it be a government enterprise the technical chain continues up through Minister to Chief of State (President). Table I shows the relative proportion of each of the essential abilities in the total assessment of any employee. This sum total is, in each case, represented by 100 for a perfect employee, be he worker, technical head, or Chief of State. It is worthy of note that there is no question here of comparing the assessment of a worker with that of a foreman, manager, or Chief of State. There is no common measure of these divers values. The units $a, b, c, d, \dots m, n, o, p$, are neither of the same kind nor of equal importance; the elements of which they are composed are changed in transference from one scalar grade to another, so that in the end there is no longer anything in common as between the ability—technical, managerial or other—of a lower employee and the corresponding ability of a higher manager. I have sought to explain in Tables I–IV merely the relative importance of the various abilities which make up the sum total of an employee. The co-efficients assigned to the various abilities composing the sum total of any employee of no matter what category express my personal opinion, and are therefore open to discussion, and I feel sure that they will be discussed. Nevertheless, I think that whatsoever differences of assessment are thrown up the conclusions which I have drawn from Table I will hold good in entirety. These are the conclusions—

1. The most important ability on the part of the worker is technical ability.

2. As one goes up the scalar chain the relative importance of managerial ability increases, while that of technical ability decreases, and equilibrium as between the two abilities is reached towards the third or fourth level up.

3. The most important ability on the part of the manager is managerial ability and the higher the level of authority the more dominant this ability.

4. Commercial, financial, security, and accounting abilities attain their maximum relative importance in the case of employees of the fifth or sixth level up. Proportionately as one goes up the scale the relative importance of these abilities in the evaluation of each class of employee decreases, and tends to even out.

5. After the fifth or sixth level the managerial co-efficient increases only at the expense of the others, which decline approximating to one-tenth of the total evaluation.

The foregoing conclusions are drawn entirely from an examination of the abilities of the personnel of the technical function, ranging from workman to head of the business. No one of these members of the personnel is exclusively concerned with the technical function; all contribute broadly more or less to the other functions and we have just noted that higher managers are more managers than technical men.

Scrutiny of abilities in the case of the other functions (commercial, financial, security, accounting) of a large industrial undertaking gives rise to similar observations and identical conclusions; the term technical ability merely requires to be replaced by that of the ability appropriate to the particular function. Whatever function is in question the

TABLE II
RELATIVE IMPORTANCE OF REQUISITE ABILITIES OF PERSONNEL IN
INDUSTRIAL CONCERNS

| | REQUISITE ABILITIES | | | | | | |
|-----------------------|---------------------------|---------------------|---------------------------|---------------------|--------------------|---------------------------|-------------------------------|
| | Man- a- gerial % | Tech- nical % | Com- mer- cial % | Finan- cial % | Secur- ity % | Ac- count- ing % | Total Evalu- ation % |
| One-man busi- ness | 15 | 40 | 20 | 10 | 5 | 10 | 100 (<i>m</i>) |
| Small firm | 25 | 30 | 15 | 10 | 10 | 10 | 100 (<i>n</i>) |
| Medium-sized firm | 30 | 25 | 15 | 10 | 10 | 10 | 100 (<i>o</i>) |
| Large firm | 40 | 15 | 15 | 10 | 10 | 10 | 100 (<i>p</i>) |
| Very large firm | 50 | 10 | 10 | 10 | 10 | 10 | 100 (<i>q</i>) |
| State enter- prise | 60 | 8 | 8 | 8 | 8 | 8 | 100 (<i>r</i>) |

most important ability required of the lower ranks is ability characteristic of the function, viz. technical on the industrial side, commercial in the case of the commercial side, financial on the financial side, etc., and the outstanding ability demanded of the higher ranks is managerial ability.

Table II. Relative importance of the requisite abilities of heads of industrial concerns of all sizes.

This table has been built up in the same way as the preceding one. The total assessment of the good head is put as 100 and the co-efficients assigned to the various abilities of heads of every type are the outcome of my personal opinion. From this table the following conclusions may be drawn—

1. The most important ability of the head of the small industrial concern is technical ability.

2. As one goes up the scalar chain the relative importance of managerial ability increases and that of technical ability declines. Equilibrium between these two obtains in medium-sized concerns.

3. The most important ability on the part of heads of large concerns is managerial ability and the more important the concern the greater the place occupied by this ability.

4. Commercial and financial ability play a much more important part in the case of heads of small and middle-sized firms than they do in the case of lower and medium grades of employees of the technical function.

5. As one goes up the scale of industrial concerns the managerial co-efficient increases only at the expense of the rest, which tend to even out approximating to one-tenth of the total evaluation. Save for the difference resulting from the fact that heads of all businesses, even the smallest, need commercial and financial abilities, whilst lower grades of the technical function can do without them, the conclusions drawn from Table II bear a striking resemblance to those drawn from Table I. The most outstanding fact thrown up by these two is the following: Technical ability is the most important one required of the lower grades of large concerns and heads of small concerns, managerial ability is the most important ability demanded of higher managers. Technical ability predominates lower down the ladder and managerial ability higher up. This

TABLE III

REQUISITE ABILITIES FOR PERSONNEL OF THE TECHNICAL FUNCTION OF A LARGE CONCERN

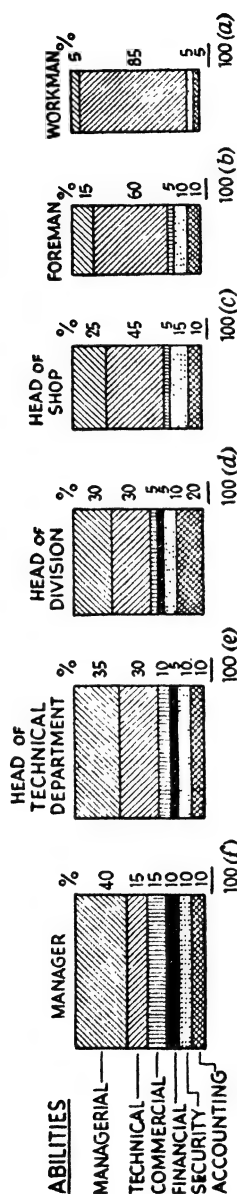
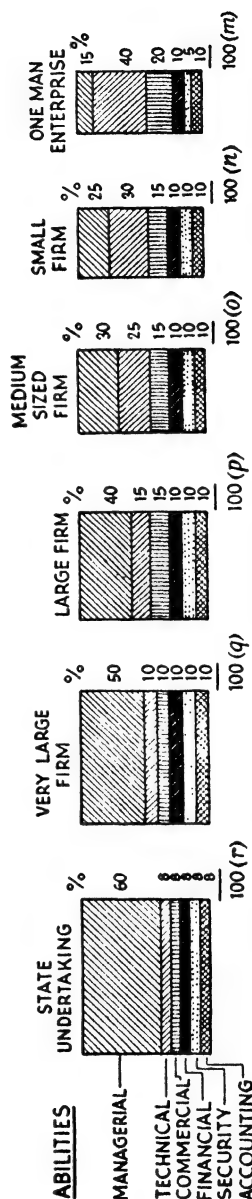


TABLE IV

REQUISITE ABILITIES FOR HEADS OF INDUSTRIAL CONCERNS OF ALL SIZES



TABLES III AND IV
RELATIVE IMPORTANCE OF REQUISITE ABILITIES OF PERSONNEL IN
INDUSTRIAL CONCERNS

fact has such importance from the dual aspect of business organization and government that I have had no qualms about using manifold ways of imparting it. Hence Tables I and II; hence, too, the diagrams (Tables III and IV) which are merely reproductions under another guise of Tables I and II. Hence, furthermore, the diagram (Table V) entitled "Relative importance of requisite abilities of different groups of employees in a large metallurgical firm." All these tables have as their object the drawing of general attention to the importance of the managerial function in industrial concerns. The technical function has long been accorded the due rank which it must keep, but it is not sufficient of itself to ensure the smooth conduct of business affairs; assistance is needed from the other essential functions and in particular from the managerial function.

SUNDRY UNDERTAKINGS

A study of the abilities requisite for employees and heads of all kinds of concerns leads to the same conclusions as the foregoing study of abilities required of employees and heads of industrial concerns. The conclusions are summarized thus—

In firms of every kind the most important ability of the lower grades is the technical ability characteristic of the firm and the most important ability of higher management is managerial ability. Therefore there is widespread need for conceptions of management.

CHAPTER III

NEED FOR AND POSSIBILITY OF MANAGEMENT TEACHING

WE have just seen that the work of government consists in carrying out and fulfilling the six essential functions. Should one of these functions not be carried out, the business may founder and in any case is weakened. Therefore the personnel of any concern should be capable of carrying out the six essential functions. [We have seen that the ability most essential in the case of higher grades of employee is managerial.] So we are certain that an exclusively technical education fails to answer the general needs of undertakings, even industrial ones. Now, whilst the greatest effort is being made, and profitably so, to spread and perfect technical knowledge, nothing, or almost nothing, is being done in our training establishments for industry to equip future leaders for their technical, financial, managerial, or other functions. Management does not even figure in the syllabuses of our colleges of civil engineering—why? Is it that the importance of managerial ability is misunderstood? No. Whether it be a case of choosing a foreman from among workmen or superintendent from among foremen, or a manager from among engineers, it is never, or almost never, technical ability which governs the choice. Naturally care is taken to see that the requisite degree of technical ability is present, but that done, preference is given when considering candidates of roughly the same technical standing, to the one who seems superior in bearing, authority, orderliness, organization, and other characteristics which are the very elements of managerial ability. Does the reason for this lie in the fact that managerial ability can only be acquired in business practice? I can well believe that this is the reason put forward, but it will be seen that it carries no weight and that managerial ability can and should be acquired in the same way as technical ability, first at school, later in the workshop.

The real reason for the absence of management teaching in our vocational schools is absence of theory; without theory

no teaching is possible. Now there exists no generally accepted theory of management emanating from general discussion. There is no shortage of personal theorizing, but failing any accepted theory each one thinks that he has the best methods and everywhere there may be observed—in industry, the army, the home, the State—the most contradictory practices under the aegis of the same principle. Whereas in the technical sphere a head would not dare to infringe certain established rules without risking total loss of prestige, in the managerial one the most undesirable practices may be indulged in with impunity. The methods used are judged not on their own merits but on their results, which often are very remote and mostly difficult to relate to their causes. The situation might be quite otherwise were there an accepted theory, that is to say, a collection of principles, rules, methods, procedures, tried and checked by general experience. It is not principles which are lacking: were it sufficient to proclaim them to have them prevail we should enjoy the best possible management everywhere. Who has not heard proclaimed a hundred times the need for the grand principles of authority, discipline, subordination of individual interest to the common good, unity of direction, co-ordination of effort, foresight, etc.? It must be admitted that proclamation is not enough. The fact is that the light of principles, like that of lighthouses, guides only those who already know the way into port, and a principle bereft of the means of putting it into practice is of no avail. *with out hope*

Nor is there any lack of methods: their name is legion, but good and bad are to be found side by side at the same time in the home, workshop and State, with a persistence only to be explained by lack of theory. The general public is not in a position to pass judgment on managerial activity, hence the importance of establishing a theory of management as soon as possible. It would be neither lengthy nor difficult if a few industrial leaders decided to set forth their personal views on the general principles which they consider most calculated to promote smooth running and on the means most conducive to the realization of such principles. Light would soon be thrown on the subject as the result of comparison and discussion. But the majority of higher managers have neither time nor inclination for writing and most often depart without leaving either

doctrine or disciples. Hence too much reliance must not be placed on help from this quarter.

Fortunately there is no need to be concerned with the running of a large-scale undertaking nor to proffer a masterly treatise in order to make useful contribution to the building up of theory. The slightest comment appropriately made is of value, and since there is no limit to the possible number of commentators it is to be hoped that once the stream has started to flow it will not be stemmed. It is a case of setting it going, starting general discussion—that is what I am trying to do by publishing this survey, and I hope that a theory will emanate from it. This done, there is the question of teaching to be solved. Everyone needs some concepts of management; in the home, in affairs of State, the need for managerial ability is in keeping with the importance of the undertaking, and for individual people the need is everywhere greater in accordance with the position occupied. Hence there should be some generalized teaching of management; elementary in the primary schools, somewhat wider in the post-primary schools, and quite advanced in higher educational establishments. This teaching will no more make good managers out of all its pupils than technical teaching makes excellent technicians out of its trainees. All that would be asked of it would be services analogous to those rendered by technical education. And why not? It is chiefly a matter of putting young people in the way of understanding and using the lessons of experience. At present the beginner has neither management theory nor method, and in this respect some remain beginners all their lives. Hence an effort must be made to spread management ideas throughout all ranks of the population. Obviously school has a large part to play in this teaching. In establishments for higher education teachers will be well able to work out their courses the day when management forms part of their teaching. It is more difficult to conceive what primary school teaching of management should be. On this point I have made an attempt which I shall set out, without claiming anything for it, in the conviction that a good primary teacher will be better able than I am to select from theory and put within his pupils' reach what is suitable to teach them.

PART II
PRINCIPLES AND ELEMENTS
OF MANAGEMENT

CHAPTER IV

GENERAL PRINCIPLES OF MANAGEMENT

THE managerial function finds its only outlet through the members of the organization (body corporate). Whilst the other functions bring into play material and machines the managerial function operates only on the personnel. The soundness and good working order of the body corporate depend on a certain number of conditions termed indiscriminately principles, laws, rules. For preference I shall adopt the term principles whilst dissociating it from any suggestion of rigidity, for there is nothing rigid or absolute in management affairs, it is all a question of proportion. Seldom do we have to apply the same principle twice in identical conditions; allowance must be made for different changing circumstances, for men just as different and changing and for many other variable elements.

Therefore principles are flexible and capable of adaptation to every need; it is a matter of knowing how to make use of them, which is a difficult art requiring intelligence, experience, decision and proportion. Compounded of tact and experience, proportion is one of the foremost attributes of the manager. There is no limit to the number of principles of management, every rule or managerial procedure which strengthens the body corporate or facilitates its functioning has a place among the principles so long, at least, as experience confirms its worthiness. A change in the state of affairs can be responsible for change of rules which had been engendered by that state.

I am going to review some of the principles of management which I have most frequently had to apply; viz.—

1. Division of work.
2. Authority.
3. Discipline.
4. Unity of command.
5. Unity of direction.
6. Subordination of individual interests to the general interest.
7. Remuneration.

8. Centralization.
9. Scalar chain (line of authority).
10. Order.
11. Equity.
12. Stability of tenure of personnel.
13. Initiative.
14. Esprit de corps.

1. Division of Work

Specialization belongs to the natural order; it is observable in the animal world, where the more highly developed the creature the more highly differentiated its organs; it is observable in human societies where the more important the body corporate¹ the closer is the relationship between structure and function. As society grows, so new organs develop destined to replace the single one performing all functions in the primitive state.

(The object of division of work is to produce more and better work with the same effort) The worker always on the same part, the manager concerned always with the same matters, acquire an ability, sureness, and accuracy which increase their output. Each change of work brings in its train an adaptation which reduces output. Division of work permits of reduction in the number of objects to which attention and effort must be directed and has been recognized as the best means of making use of individuals and of groups of people. It is not merely applicable to technical work, but without exception to all work involving a more or less considerable number of people and demanding abilities of various types, and it results in specialization of functions and separation of powers. Although its advantages are universally recognized and although possibility of progress is inconceivable without the specialized work of learned men and artists, yet division of work has its limits which experience and a sense of proportion teach us may not be exceeded.

¹ "*Body corporate.*" Fayol's term "*corps social*," meaning all those engaged in a given corporate activity in any sphere, is best rendered by this somewhat unusual term because

(a) it retains his implied biological metaphor;

(b) it represents the structure as distinct from the process of organization.

The term will be retained in all contexts where these two requirements have to be met. [*Translator's note.*]

2. Authority and Responsibility

Authority is the right to give orders and the power to exact obedience. Distinction must be made between a manager's official authority deriving from office and personal authority, compounded of intelligence, experience, moral worth, ability to lead, past services, etc. In the make up of a good head personal authority is the indispensable complement of official authority. Authority is not to be conceived of apart from responsibility, that is apart from sanction—reward or penalty—which goes with the exercise of power. Responsibility is a corollary of authority, it is its natural consequence and essential counterpart, and wheresoever authority is exercised responsibility arises.

The need for sanction, which has its origin in a sense of justice, is strengthened and increased by this consideration, that in the general interest useful actions have to be encouraged and their opposite discouraged. Application of sanction to acts of authority forms part of the conditions essential for good management, but it is generally difficult to effect, especially in large concerns. First, the degree of responsibility must be established and then the weight of the sanction. Now, it is relatively easy to establish a workman's responsibility for his acts and a scale of corresponding sanctions; in the case of a foreman it is somewhat difficult, and proportionately as one goes up the scalar chain of businesses, as work grows more complex, as the number of workers involved increases, as the final result is more remote, it is increasingly difficult to isolate the share of the initial act of authority in the ultimate result and to establish the degree of responsibility of the manager. The measurement of this responsibility and its equivalent in material terms elude all calculation.

Sanction, then, is a question of kind, custom, convention, and judging it one must take into account the action itself, the attendant circumstances and potential repercussions. Judgment demands high moral character, impartiality and firmness. If all these conditions are not fulfilled there is a danger that the sense of responsibility may disappear from the concern.

Responsibility valiantly undertaken and borne merits some consideration; it is a kind of courage everywhere much

appreciated. Tangible proof of this exists in the salary level of some industrial leaders, which is much higher than that of civil servants of comparable rank but carrying no responsibility. Nevertheless, generally speaking, responsibility is feared as much as authority is sought after, and fear of responsibility paralyses much initiative and destroys many good qualities. A good leader should possess and infuse into those around him courage to accept responsibility.

The best safeguard against abuse of authority and against weakness on the part of a higher manager is personal integrity and particularly high moral character of such a manager, and this integrity, it is well known, is conferred neither by election nor ownership.

3. Discipline

Discipline is in essence obedience, application, energy, behaviour, and outward marks of respect observed in accordance with the standing agreements between the firm and its employees, whether these agreements have been freely debated or accepted without prior discussion, whether they be written or implicit, whether they derive from the wish of the parties to them or from rules and customs, it is these agreements which determine the formalities of discipline.

Discipline, being the outcome of different varying agreements, naturally appears under the most diverse forms; obligations of obedience, application, energy, behaviour, vary, in effect, from one firm to another, from one group of employees to another, from one time to another. Nevertheless, general opinion is deeply convinced that discipline is absolutely essential for the smooth running of business and that without discipline no enterprise could prosper.

This sentiment is very forcibly expressed in military handbooks, where it runs that "Discipline constitutes the chief strength of armies." I would approve unreservedly of this aphorism were it followed by this other, "Discipline is what leaders make it." The first one inspires respect for discipline, which is a good thing, but it tends to eclipse from view the responsibility of leaders, which is undesirable, for the state of discipline of any group of people depends essentially on the worthiness of its leaders.

When a defect in discipline is apparent or when relations between superiors and subordinates leave much to be desired, responsibility for this must not be cast heedlessly, and without going further afield, on the poor state of the team, because the ill mostly results from the ineptitude of the leaders. That, at all events, is what I have noted in various parts of France, for I have always found French workmen obedient and loyal provided they are ably led.

In the matter of influence upon discipline, agreements must be set side by side with command. It is important that they be clear and, as far as is possible, afford satisfaction to both sides. This is not easy. Proof of that exists in the great strikes of miners, railwaymen, and civil servants which, in these latter years, have jeopardized national life at home and elsewhere and which arose out of agreements in dispute or inadequate legislation.

For half a century a considerable change has been effected in the mode of agreements between a concern and its employees. The agreements of former days fixed by the employer alone are being replaced, in ever increasing measure, by understandings arrived at by discussion between an owner or group of owners and workers' associations. Thus each individual owner's responsibility has been reduced and is further diminished by increasingly frequent State intervention in labour problems. Nevertheless, the setting up of agreements binding a firm and its employees from which disciplinary formalities emanate, should remain one of the chief preoccupations of industrial heads.

The well-being of the concern does not permit, in cases of offence against discipline, of the neglect of certain sanctions capable of preventing or minimizing their recurrence. Experience and tact on the part of a manager are put to the proof in the choice and degree of sanctions to be used, such as remonstrances, warnings, fines, suspensions, demotion, dismissal. Individual people and attendant circumstances must be taken into account. In fine, discipline is respect for agreements which are directed at achieving obedience, application, energy, and the outward marks of respect. It is incumbent upon managers at high levels as much as upon humble employees, and the best means of establishing and maintaining it are—

- ✓ 1. Good superiors at all levels.
- ✓ 2. Agreements as clear and fair as possible.
- 3. Sanctions (penalties) judiciously applied.

4. *Unity of Command*

For any action whatsoever, an employee should receive orders from one superior only. Such is the rule of unity of command, arising from general and ever-present necessity and wielding an influence on the conduct of affairs, which to my way of thinking, is at least equal to any other principle whatsoever. Should it be violated, authority is undermined, discipline is in jeopardy, order disturbed and stability threatened. This rule seems fundamental to me and so I have given it the rank of principle. As soon as two superiors wield their authority over the same person or department, uneasiness makes itself felt and should the cause persist, the disorder increases, the malady takes on the appearance of an animal organism troubled by a foreign body, and the following consequences are to be observed: either the dual command ends in disappearance or elimination of one of the superiors and organic well-being is restored, or else the organism continues to wither away. In no case is there adaptation of the social organism to dual command.

Now dual command is extremely common and wreaks havoc in all concerns, large or small, in home and in State. The evil is all the more to be feared in that it worms its way into the social organism on the most plausible pretexts. For instance—

(a) In the hope of being better understood or gaining time or to put a stop forthwith to an undesirable practice, a superior S^2 may give orders directly to an employee E without going via the superior S^1 . If this mistake is repeated there is dual command with its consequences, viz., hesitation on the part of the subordinate, irritation and dissatisfaction on the part of the superior set aside, and disorder in the work. It will be seen later that it is possible to by-pass the scalar chain when necessary, whilst avoiding the drawbacks of dual command.

(b) The desire to get away from the immediate necessity of dividing up authority as between two colleagues, two friends, two members of one family, results at times in dual command

reigning at the top of a concern right from the outset. Exercising the same powers and having the same authority over the same men, the two colleagues end up inevitably with dual command and its consequences. Despite harsh lessons, instances of this sort are still numerous. New colleagues count on their mutual regard, common interest, and good sense to save them from every conflict, every serious disagreement and, save for rare exceptions, the illusion is short-lived. First an awkwardness makes itself felt, then a certain irritation and, in time, if dual command exists, even hatred. Men cannot bear dual command. A judicious assignment of duties would have reduced the danger without entirely banishing it, for between two superiors on the same footing there must always be some question ill-defined. But it is riding for a fall to set up a business organization with two superiors on equal footing without assigning duties and demarcating authority.

(c) Imperfect demarcation of departments also leads to dual command: two superiors issuing orders in a sphere which each thinks his own, constitutes dual command.

(d) Constant linking up as between different departments, natural intermeshing of functions, duties often badly defined, create an ever-present danger of dual command. If a knowledgeable superior does not put it in order, footholds are established which later upset and compromise the conduct of affairs.

In all human associations, in industry, commerce, army, home, State, dual command is a perpetual source of conflicts, very grave sometimes, which have special claim on the attention of superiors of all ranks.

5. Unity of Direction

This principle is expressed as: one head and one plan for a group of activities having the same objective. It is the condition essential to unity of action, co-ordination of strength and focusing of effort. A body with two heads is in the social as in the animal sphere a monster, and has difficulty in surviving. Unity of direction (one head one plan) must not be confused with unity of command (one employee to have orders from one superior only). Unity of direction is provided for by sound

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organization of the body corporate, unity of command turns on the functioning of the personnel. Unity of command cannot exist without unity of direction, but does not flow from it.

6. Subordination of Individual Interest to General Interest

This principle calls to mind the fact that in a business the interest of one employee or group of employees should not prevail over that of the concern, that the interest of the home should come before that of its members and that the interest of the State should have pride of place over that of one citizen or group of citizens.

It seems that such an admonition should not need calling to mind. But ignorance, ambition, selfishness, laziness, weakness, and all human passions tend to cause the general interest to be lost sight of in favour of individual interest and a perpetual struggle has to be waged against them. Two interests of a different order, but claiming equal respect, confront each other and means must be found to reconcile them. That represents one of the great difficulties of management. Means of effecting it are—

1. Firmness and good example on the part of superiors.
2. Agreements as fair as is possible.
3. Constant supervision.

7. Remuneration of Personnel

Remuneration of personnel is the price of services rendered. It should be fair and, as far as is possible, afford satisfaction both to personnel and firm (employee and employer). The rate of remuneration depends, firstly, on circumstances independent of the employer's will and employee's worth, viz. cost of living, abundance or shortage of personnel, general business conditions, the economic position of the business, and after that it depends on the value of the employee and mode of payment adopted. Appreciation of the factors dependent on the employer's will and on the value of employees, demands a fairly good knowledge of business, judgment, and impartiality. Later on in connection with selecting personnel we shall deal with assessing the value of employees; here only the mode of payment is under

consideration as a factor operating on remuneration. The method of payment can exercise considerable influence on business progress, so the choice of this method is an important problem. It is also a thorny problem which in practice has been solved in widely different ways, of which so far none has proved satisfactory. What is generally looked for in the method of payment is that—

1. It shall assure fair remuneration.
2. It shall encourage keenness by rewarding well-directed effort.
3. It shall not lead to over-payment going beyond reasonable limits.

I am going to examine briefly the modes of payment in use for workers, junior managers, and higher managers.

Workers

The various modes of payment in use for workers are—

1. Time rates.
2. Job rates.
3. Piece rates.

These three modes of payment may be combined and give rise to important variations by the introduction of bonuses, profit-sharing schemes, payment in kind, and non-financial incentives.

1. *Time Rates.* Under this system the workman sells the employer, in return for a pre-determined sum, a day's work under definite conditions. This system has the disadvantage of conducing to negligence and of demanding constant supervision. It is inevitable where the work done is not susceptible to measurement and in effect it is very common.

2. *Job Rates.* Here payment made turns upon the execution of a definite job set in advance and may be independent of the length of the job. When payment is due only on condition that the job be completed during the normal work spell, this method merges into time rate. Payment by daily job does not require as close a supervision as payment by the day, but it has the drawback of levelling the output of good workers down to that of mediocre ones. The good ones are not satisfied, because they feel that they could earn more; the mediocre ones find the task set too heavy.

3. *Piece Rates.* Here payment is related to work done and there is no limit. This system is often used in workshops where a large number of similar articles have to be made, and is found where the product can be measured by weight, length, or cubic capacity, and in general is used wherever possible. It is criticized on the grounds of emphasizing quantity at the expense of quality and of provoking disagreements when rates have to be revised in the light of manufacturing improvements. Piece-work becomes contract work when applied to an important unit of work. To reduce the contractor's risk, sometimes there is added to the contract price a payment for each day's work done.

Generally, piece rates give rise to increased earnings which act for some time as a stimulus, then finally a system prevails in which this mode of payment gradually approximates to time rates for a pre-arranged sum.

The above three modes of payment are found in all large concerns; sometimes time rates prevail, sometimes one of the other two. In a workshop the same workman may be seen working now on piece rates, now on time rates. Each one of these methods has its advantages and drawbacks, and their effectiveness depends on circumstances and the ability of superiors. Neither method nor rate of payment absolves management from competence and tact, and keenness of workers and peaceful atmosphere of the workshop depend largely upon it.

Bonuses

To arouse the worker's interest in the smooth running of the business, sometimes an increment in the nature of a bonus is added to the time-, job- or piece-rate: for good time keeping, hard work, freedom from machine breakdown, output, cleanliness, etc. The relative importance, nature and qualifying conditions of these bonuses are very varied. There are to be found the small daily supplement, the monthly sum, the annual award, shares or portions of shares distributed to the most meritorious, and also even profit-sharing schemes such as, for example, certain monetary allocations distributed annually among workers in some large firms. Several French

collieries started some years back the granting of a bonus proportional to profits distributed or to extra profits. No contract is required from the workers save that the earning of the bonus is subject to certain conditions, for instance, that there shall have been no strike during the year, or that absenteeism shall not have exceeded a given number of days. This type of bonus introduced an element of profit-sharing into miners' wages without any prior discussion as between workers and employer. The workman did not refuse a gift, largely gratuitous, on the part of the employer, that is, the contract was a unilateral one. Thanks to a successful trading period the yearly wages have been appreciably increased by the operation of the bonus. But what is to happen in lean times? This interesting procedure is as yet too new to be judged, but obviously it is no general solution of the problem.

In the mining industry there is another type of bonus, dependent upon the selling price of coal. The sliding scale of wages depending on a basic rate plus a bonus proportionate to the local selling price, which had long flourished in Wales, but was discontinued when minimum wages legislation came into force, is to-day the principle regulating the payment of miners in the Nord and Pas de Calais *départements*, and has also been adopted in the Loire region. This system established a certain fixed relationship between the prosperity of the colliery and the miner's wage. It is criticized on the grounds that it conduces to limitation of production in order to raise selling price. So we see that it is necessary to have recourse to a variety of methods in order to settle wages questions. The problem is far from being settled to everyone's satisfaction and all solutions are hazardous.

Profit-sharing

Workers. The idea of making workers share in profits is a very attractive one and it would seem that it is from there that harmony as between Capital and Labour should come. But the practical formula for such sharing has not yet been found. Workers' profit-sharing has hitherto come up against insurmountable difficulties of application in the case of large concerns. Firstly, let us note that it cannot exist in enterprises

having no monetary objective (State services, religions, philanthropic, scientific societies) and also that it is not possible in the case of businesses running at a loss. Thus profit-sharing is excluded from a great number of concerns. There remain the prosperous business concerns and of these latter the desire to reconcile and harmonize workers' and employers' interests is nowhere so great as in French mining and metallurgical industries. Now, in these industries I know of no clear application of workers' profit-sharing, whence it may be concluded forthwith that the matter is difficult, if not impossible. It is very difficult indeed. Whether a business is making a profit or not the worker must have an immediate wage assured him, and a system which would make workers' payment depend entirely on eventual future profit is unworkable. But perhaps a part of wages might come from business profits. Let us see. Viewing all contingent factors, the workers' greater or lesser share of activity or ability in the final outcome of a large concern is impossible to assess and is, moreover, quite insignificant. The portion accruing to him of distributed dividend would at the most be a few centimes on a wage of five francs for instance, that is to say the smallest extra effort, the stroke of a pick or of a file operating directly on his wage, would prove of greater advantage to him. Hence the worker has no interest in being rewarded by a share in profits proportionate to the effect he has upon profits. It is worthy of note that, in most large concerns, wages increases, operative now for some twenty years, represent a total sum greater than the amount of capital shared out. In effect, unmodified real profit-sharing by workers of large concerns has not yet entered the sphere of practical business politics.

Junior Managers. Profit-sharing for foremen, superintendents, engineers, is scarcely more advanced than for workers. Nevertheless, the influence of these employees on the results of a business is quite considerable, and if they are not consistently interested in profits the only reason is that the basis for participation is difficult to establish. Doubtless managers have no need of monetary incentive to carry out their duties, but they are not indifferent to material satisfactions and it must be acknowledged that the hope of extra profit is capable of arousing their enthusiasm. So employees at middle levels should,

where possible, be induced to have an interest in profits. It is relatively easy in businesses which are starting out or on trial, where exceptional effort can yield outstanding results. Sharing may then be applied to overall business profits or merely to the running of the particular department of the employee in question. When the business is of long standing and well run the zeal of a junior manager is scarcely apparent in the general outcome, and it is very hard to establish a useful basis on which he may participate. In fact, profit-sharing among junior managers in France is very rare in large concerns. Production or workshop output bonuses—not to be confused with profit-sharing—are much more common.

Higher Managers. It is necessary to go right up to top management to find a class of employee with frequent interest in the profits of large-scale French concerns. The head of the business, in view of his knowledge, ideas, and actions, exerts considerable influence on general results, so it is quite natural to try and provide him with an interest in them. Sometimes it is possible to establish a close connection between his personal activity and its effects. Nevertheless, generally speaking, there exist other influences quite independent of the personal capability of the manager which can influence results to a greater extent than can his personal activity. If the manager's salary were exclusively dependent upon profits, it might at times be reduced to nothing. There are besides, businesses being built up, wound up, or merely passing through temporary crisis, wherein management depends no less on talent than in the case of prosperous ones, and wherein profit-sharing cannot be a basis for remuneration for the manager. In fine, senior civil servants cannot be paid on a profit-sharing basis. Profit-sharing, then, for either higher managers or workers is not a general rule of remuneration. To sum up, then: profit-sharing is a mode of payment capable of giving excellent results in certain cases, but is not a general rule. It does not seem to me possible, at least for the present, to count on this mode of payment for appeasing conflict between Capital and Labour. Fortunately, there are other means which hitherto have been sufficient to maintain relative social quiet. Such methods have not lost their power and it is up to managers to study them, apply them, and make them work well.

Payment in Kind, Welfare Work, Non-financial Incentives

Whether wages are made up of money only or whether they include various additions such as heating, light, housing, food, is of little consequence provided that the employee be satisfied.

From another point of view, there is no doubt that a business will be better served in proportion as its employees are more energetic, better educated, more conscientious and more permanent. The employer should have regard, if merely in the interests of the business, for the health, strength, education, morale, and stability of his personnel. These elements of smooth running are not acquired in the workshop alone, they are formed and developed as well, and particularly, outside it, in the home and school, in civil and religious life. Therefore, the employer comes to be concerned with his employees outside the works and here the question of proportion comes up again. Opinion is greatly divided on this point. Certain unfortunate experiments have resulted in some employers stopping short their interest, at the works gate and at the regulation of wages. The majority consider that the employer's activity may be used to good purpose outside the factory confines provided that there be discretion and prudence, that it be sought after rather than imposed, be in keeping with the general level of education and taste of those concerned and that it have absolute respect for their liberty. It must be benevolent collaboration, not tyrannical stewardship, and therein lies an indispensable condition of success.

The employer's welfare activities may be of various kinds. In the works they bear on matters of hygiene and comfort: ventilation, lighting, cleanliness, canteen facilities. Outside the works they bear on housing accommodation, feeding, education, and training. Provident schemes come under this head.

Non-financial incentives only come in in the case of large scale concerns and may be said to be almost exclusively in the realm of government work. Every mode of payment likely to make the personnel more valuable and improve its lot in life, and also to inspire keenness on the part of employees at all levels, should be a matter for managers' constant attention.

8. *Centralization*

Like division of work, centralization belongs to the natural order; this turns on the fact that in every organism, animal or social, sensations converge towards the brain or directive part, and from the brain or directive part orders are sent out which set all parts of the organism in movement. Centralization is not a system of management good or bad of itself, capable of being adopted or discarded at the whim of managers or of circumstances; it is always present to a greater or less extent. The question of centralization or decentralization, is a simple question of proportion, it is a matter of finding the optimum degree for the particular concern. In small firms, where the manager's orders go directly to subordinates there is absolute centralization; in large concerns, where a long scalar chain is interposed between manager and lower grades, orders and counter-information too, have to go through a series of intermediaries. Each employee, intentionally or unintentionally, puts something of himself into the transmission and execution of orders and of information received too. He does not operate merely as a cog in a machine. What appropriate share of initiative may be left to intermediaries depends on the personal character of the manager, on his moral worth, on the reliability of his subordinates, and also on the condition of the business. The degree of centralization must vary according to different cases. The objective to pursue is the optimum utilization of all faculties of the personnel.

If the moral worth of the manager, his strength, intelligence, experience and swiftness of thought allow him to have a wide span of activities he will be able to carry centralization quite far and reduce his seconds in command to mere executive agents. If, conversely, he prefers to have greater recourse to the experience, opinions, and counsel of his colleagues whilst reserving to himself the privilege of giving general directives, he can effect considerable decentralization.

Seeing that both absolute and relative value of manager and employees are constantly changing, it is understandable that the degree of centralization or decentralization may itself vary constantly. It is a problem to be solved according to circumstances, to the best satisfaction of the interests involved. It

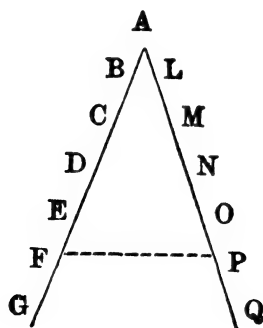
arises, not only in the case of higher authority, but for superiors at all levels and not one but can extend or confine, to some extent, his subordinates' initiative.

The finding of the measure which shall give the best overall yield: that is the problem of centralization or decentralization. Everything which goes to increase the importance of the subordinate's rôle is decentralization, everything which goes to reduce it is centralization.

9. *Scalar Chain*

The scalar chain is the chain of superiors ranging from the ultimate authority to the lowest ranks. The line of authority is the route followed—via every link in the chain—by all communications which start from or go to the ultimate authority. This path is dictated both by the need for some transmission and by the principle of unity of command, but it is not always the swiftest. It is even at times disastrously lengthy in large concerns, notably in governmental ones. Now, there are many activities whose success turns on speedy execution, hence respect for the line of authority must be reconciled with the need for swift action.

Let us imagine that section *F* has to be put into contact with section *P* in a business whose scalar chain is represented by the double ladder *G-A-Q* thus—



By following the line of authority the ladder must be climbed from *F* to *A* and then descended from *A* to *P*, stopping at

each rung, then ascended again from *P* to *A*, and descended once more from *A* to *F*, in order to get back to the starting point. Evidently it is much simpler and quicker to go directly from *F* to *P* by making use of *FP* as a "gang plank" and that is what is most often done. The scalar principle will be safeguarded if managers *E* and *O* have authorized their respective subordinates *F* and *P* to treat directly, and the position will be fully regularized if *F* and *P* inform their respective superiors forthwith of what they have agreed upon. So long as *F* and *P* remain in agreement, and so long as their actions are approved by their immediate superiors, direct contact may be maintained, but from the instant that agreement ceases or there is no approval from the superiors direct contact comes to an end, and the scalar chain is straightway resumed. Such is the actual procedure to be observed in the great majority of businesses. It provides for the usual exercise of some measure of initiative at all levels of authority. In the small concern, the general interest, viz. that of the concern proper, is easy to grasp, and the employer is present to recall this interest to those tempted to lose sight of it. In government enterprise the general interest is such a complex, vast, remote thing, that it is not easy to get a clear idea of it, and for the majority of civil servants the employer is somewhat mythical and unless the sentiment of general interest be constantly revived by higher authority, it becomes blurred and weakened and each section tends to regard itself as its own aim and end and forgets that it is only a cog in a big machine, all of whose parts must work in concert. It becomes isolated, cloistered, aware only of the line of authority.

The use of the "gang plank" is simple, swift, sure. It allows the two employees *F* and *P* to deal at one sitting, and in a few hours, with some question or other which via the scalar chain would pass through twenty transmissions, inconvenience many people, involve masses of paper, lose weeks or months to get to a conclusion less satisfactory generally than the one which could have been obtained via direct contact as between *F* and *P*.

Is it possible that such practices, as ridiculous as they are devastating, could be in current use? Unfortunately there can be little doubt of it in government department affairs. It is

usually acknowledged that the chief cause is fear of responsibility. I am rather of the opinion that it is insufficient executive capacity on the part of those in charge. If supreme authority *A* insisted that his assistants *B* and *L* made use of the "gang plank" themselves and made its use incumbent upon their subordinates *C* and *M*, the habit and courage of taking responsibility would be established and at the same time the custom of using the shortest path.

It is an error to depart needlessly from the line of authority, but it is an even greater one to keep to it when detriment to the business ensues. The latter may attain extreme gravity in certain conditions. When an employee is obliged to choose between the two practices, and it is impossible for him to take advice from his superior, he should be courageous enough and feel free enough to adopt the line dictated by the general interest. But for him to be in this frame of mind there must have been previous precedent, and his superiors must have set him the example—for example must always come from above.

10. Order

The formula is known in the case of material things "A place for everything and everything in its place." The formula is the same for human order "A place for everyone and everyone in his place."

Material Order. In accordance with the preceding definition, so that material order shall prevail, there must be a place appointed for each thing and each thing must be in its appointed place. Is that enough? Is it not also necessary that the place shall have been well chosen? The object of order must be avoidance of loss of material, and for this object to be completely realized not only must things be in their place suitably arranged but also the place must have been chosen so as to facilitate all activities as much as possible. If this last condition be unfulfilled, there is merely the appearance of order. Appearance of order may cover over real disorder. I have seen a works yard used as a store for steel ingots in which the material was well stacked, evenly arranged and clean and which gave a pleasing impression of orderliness. On close inspection it could be noted that the same heap included five or six types of

steel intended for different manufacture all mixed up together. Whence useless handling, lost time, risk of mistakes because each thing was not in its place. It happens, on the other hand, that the appearance of disorder may actually be true order. Such is the case with papers scattered about at a master's whim which a well-meaning but incompetent servant re-arranges and stacks in neat piles. The master can no longer find his way about them. Perfect order presupposes a judiciously chosen place and the appearance of order is merely a false or imperfect image of real order. Cleanliness is a corollary of orderliness, there is no appointed place for dirt. A diagram representing the entire premises divided up into as many sections as there are employees responsible facilitates considerably the establishing and control of order.

Social Order. For social order to prevail in a concern there must, in accordance with the definition, be an appointed place for every employee and every employee be in his appointed place. Perfect order requires, further, that the place be suitable for the employee and the employee for the place—in English idiom, “The right man in the right place.”

Thus understood, social order presupposes the successful execution of the two most difficult managerial activities: good organization and good selection. Once the posts essential to the smooth running of the business have been decided upon and those to fill such posts have been selected, each employee occupies that post wherein he can render most service. Such is perfect social order “A place for each one and each one in his place.” That appears simple, and naturally we are so anxious for it to be so that when we hear for the twentieth time a government departmental head assert this principle, we conjure up straightway a concept of perfect administration. This is a mirage.

Social order demands precise knowledge of the human requirements and resources of the concern and a constant balance between these requirements and resources. Now this balance is most difficult to establish and maintain and all the more difficult the bigger the business, and when it has been upset and individual interests resulted in neglect or sacrifice of the general interest, when ambition, nepotism, favouritism or merely ignorance, has multiplied positions without good

reason or filled them with incompetent employees, much talent and strength of will and more persistence than current instability of ministerial appointments presupposes, are required in order to sweep away abuses and restore order.

As applied to government enterprise the principle of order "a place for each one and each one in his place," takes on an astounding breadth. It means national responsibility towards each and all, everyone's destiny mapped out, national solidarity, the whole problem of society. I will stay no longer over this disturbing extension of the principle of order. In private businesses and especially in those of restricted scope it is easier to maintain proportion as between selection and requirements. As in the case of orderly material arrangement, a chart or plan makes the establishment and control of human arrangement much more easy. This represents the personnel in entirety, and all sections of the concern together with the people occupying them. This chart will come up again in the chapter on Organization.

11. Equity

Why equity and not justice? Justice is putting into execution established conventions, but conventions cannot foresee everything, they need to be interpreted or their inadequacy supplemented. For the personnel to be encouraged to carry out its duties with all the devotion and loyalty of which it is capable it must be treated with kindness, and equity results from the combination of kindness and justice. Equity excludes neither forcefulness nor sternness and the application of it requires much good sense, experience and good nature.

Desire for equity and equality of treatment are aspirations to be taken into account in dealing with employees. In order to satisfy these requirements as much as possible without neglecting any principle or losing sight of the general interest, the head of the business must frequently summon up his highest faculties. He should strive to instil sense of equity throughout all levels of the scalar chain.

12. Stability of Tenure of Personnel

Time is required for an employee to get used to new work

and succeed in doing it well, always assuming that he possesses the requisite abilities. If when he has got used to it, or before then, he is removed, he will not have had time to render worthwhile service. If this be repeated indefinitely the work will never be properly done. The undesirable consequences of such insecurity of tenure are especially to be feared in large concerns, where the settling in of managers is generally a lengthy matter. Much time is needed indeed to get to know men and things in a large concern in order to be in a position to decide on a plan of action, to gain confidence in oneself, and inspire it in others. Hence it has often been recorded that a mediocre manager who stays is infinitely preferable to outstanding managers who merely come and go.

Generally the managerial personnel of prosperous concerns is stable, that of unsuccessful ones is unstable. Instability of tenure is at one and the same time cause and effect of bad running. The apprenticeship of a higher manager is generally a costly matter. Nevertheless, changes of personnel are inevitable; age, illness, retirement, death, disturb the human make-up of the firm; certain employees are no longer capable of carrying out their duties, whilst others become fit to assume greater responsibilities. In common with all the other principles, therefore, stability of tenure of personnel is also a question of proportion.

13. Initiative

Thinking out a plan and ensuring its success is one of the keenest satisfactions for an intelligent man to experience. It is also one of the most powerful stimulants of human endeavour. This power of thinking out and executing is what is called initiative, and freedom to propose and to execute belongs too, each in its way, to initiative. At all levels of the organizational ladder zeal and energy on the part of employees are augmented by initiative. The initiative of all, added to that of the manager, and supplementing it if need be, represents a great source of strength for businesses. This is particularly apparent at difficult times; hence it is essential to encourage and develop this capacity to the full.

Much tact and some integrity are required to inspire and maintain everyone's initiative, within the limits imposed, by

respect for authority and for discipline. The manager must be able to sacrifice some personal vanity in order to grant this sort of satisfaction to subordinates. Other things being equal, moreover, a manager able to permit the exercise of initiative on the part of subordinates is infinitely superior to one who cannot do so.

14. *Esprit de Corps*

“Union is strength.” Business heads would do well to ponder on this proverb. Harmony, union among the personnel of a concern, is great strength in that concern. Effort, then, should be made to establish it. Among the countless methods in use I will single out specially one principle to be observed and two pitfalls to be avoided. The principle to be observed is unity of command; the dangers to be avoided are (a) a misguided interpretation of the motto “divide and rule,” (b) the abuse of written communications.

(a) *Personnel must not be split up.* Dividing enemy forces to weaken them is clever, but dividing one’s own team is a grave sin against the business. Whether this error results from inadequate managerial capacity or imperfect grasp of things, or from egoism which sacrifices general interest to personal interest, it is always reprehensible because harmful to the business. There is no merit in sowing dissension among subordinates; any beginner can do it. On the contrary, real talent is needed to co-ordinate effort, encourage keenness, use each man’s abilities, and reward each one’s merit without arousing possible jealousies and disturbing harmonious relations.

(b) *Abuse of written communications.* In dealing with a business matter or giving an order which requires explanation to complete it, usually it is simpler and quicker to do so verbally than in writing. Besides, it is well known that differences and misunderstandings which a conversation could clear up, grow more bitter in writing. Thence it follows that, wherever possible, contacts should be verbal; there is a gain in speed, clarity and harmony. Nevertheless, it happens in some firms that employees of neighbouring departments with numerous points of contact, or even employees within a department, who could quite easily meet, only communicate with each other in writing. Hence arise increased work and complications and delays

harmful to the business. At the same time, there is to be observed a certain animosity prevailing between different departments or different employees within a department. The system of written communications usually brings this result. There is a way of putting an end to this deplorable system and that is to forbid all communications in writing which could easily and advantageously be replaced by verbal ones. There again, we come up against a question of proportion.

It is not merely by the satisfactory results of harmony obtaining as between employees of the same department that the power of unity is shown: commercial agreements, unions, associations of every kind, play an important part in business management.

The part played by association has increased remarkably in half a century. I remember, in 1860, workers of primary industries without cohesion, without common bond, a veritable cloud of individual dust particles; and out of that the union has produced collective associations, meeting employers on equal terms. At that same time, bitter rivalry prevailed between large firms, closely similar, which has given place gradually to friendly relations, permitting of the settlement of most common interests by joint agreement. It is the beginning of a new era which already has profoundly modified both habits and ideas, and industrial heads should take this development into account.

* * *

There I bring to an end this review of principles, not because the list is exhausted—this list has no precise limits—but because to me it seems at the moment especially useful to endow management theory with a dozen or so well-established principles, on which it is appropriate to concentrate general discussion. The foregoing principles are those to which I have most often had recourse. I have simply expressed my personal opinion in connection with them. Are they to have a place in the management code which is to be built up? General discussion will show.

This code is indispensable. Be it a case of commerce, industry, politics, religion, war, or philanthropy, in every concern there is a management function to be performed,

and for its performance there must be principles, that is to say acknowledged truths regarded as proven on which to rely. And it is the code which represents the sum total of these truths at any given moment.

Surprise might be expressed at the outset that the eternal moral principles, the laws of the Decalogue and Commandments of the Church are not sufficient guide for the manager, and that a special code is needed. The explanation is this: the higher laws of religious or moral order envisage the individual only, or else interests which are not of this world, whereas management principles aim at the success of associations of individuals and at the satisfying of economic interests. Given that the aim is different, it is not surprising that the means are not the same. There is no identity, so there is no contradiction. Without principles one is in darkness and chaos; interest, experience and proportion are still very handicapped, even with the best principles. The principle is the lighthouse fixing the bearings but it can only serve those who already know the way into port.

CHAPTER V

ELEMENTS OF MANAGEMENT

1. PLANNING

THE maxim, "managing means looking ahead," gives some idea of the importance attached to planning in the business world, and it is true that if foresight is not the whole of management at least it is an essential part of it. To foresee, in this context, means both to assess the future and make provision for it; that is, foreseeing is itself action already. Planning is manifested on a variety of occasions and in a variety of ways, its chief manifestation, apparent sign and most effective instrument being the plan of action. The plan of action is, at one and the same time, the result envisaged, the line of action to be followed, the stages to go through, and methods to use. It is a kind of future picture wherein proximate events are outlined with some distinctness, whilst remote events appear progressively less distinct, and it entails the running of the business as foreseen and provided against over a definite period.

The plan of action rests: (1) on the firm's resources (buildings, tools, raw materials, personnel, productive capacity, sales outlets, public relations, etc.). (2) on the nature and importance of work in progress. (3) on future trends which depend partly on technical, commercial, financial and other conditions, all subject to change, whose importance and occurrence cannot be pre-determined. The preparation of the plan of action is one of the most difficult and most important matters of every business and brings into play all departments and all functions, especially the management function. It is, in effect, in order to carry out his managerial function that the manager takes the initiative for the plan of action, that he indicates its objective and scope, fixes the share of each department in the communal task, co-ordinates the parts and harmonizes the whole; that he decides, in fine, the line of conduct to be followed. In this line of conduct it is not only imperative that nothing should clash with principles and rules of good management, but also that the arrangement adopted should facilitate application of these principles and rules. Therefore,

to the divers technical, commercial, financial and other abilities necessary on the part of a business head and his assistants, there must be added considerable managerial ability.

General Features of a Good Plan of Action

No one disputes the usefulness of a plan of action. Before taking action it is most necessary to know what is possible and what is wanted. It is known that absence of plan entails hesitation, false steps, untimely changes of direction, which are so many causes of weakness, if not of disaster, in business. The question of and necessity for a plan of action, then, does not arise and I think that I am voicing the general opinion in saying that a plan of action is indispensable. But there are plans and plans; there are simple ones, complex ones, concise ones, detailed ones, long- or short-term ones; there are those studied with meticulous attention, those treated lightly; there are good, bad, and indifferent ones. How are the good ones to be singled out from among the others? [Experience is the only thing that finally determines the true value of a plan,] i.e. on the services it can render to the firm, and even then the manner of its application must be taken into account. There is both instrument and player. Nevertheless, there are certain broad characteristics on which general agreement may be reached beforehand without waiting for the verdict of experience.

✓ [Unity of plan is an instance. Only one plan can be put into operation at a time; two different plans would mean duality, confusion, disorder.] But a plan may be divided into several parts.] In large concerns, there is found alongside the general plan a technical, commercial, and a financial one, or else an overall one with a specific one for each department. But all these plans are linked, welded, so as to make up one only, and every modification brought to bear on any one of them is given expression in the whole plan. The guiding action of the plan must be continuous. Now the limitations of human foresight necessarily set bounds to the duration of plans, so, in order to have no break in the guiding action, a second plan must follow immediately upon the first, a third upon the second, and so on. In large businesses the annual plan is more or less

in current use. Other plans of shorter or longer term, always in close accord with the annual plan, operate simultaneously with this latter. The plan should be flexible enough to bend before such adjustments, as it is considered well to introduce, whether from pressure of circumstances or from any other reason. First as last, it is the law to which one bows. Another good point about a plan is to have as much accuracy as is compatible with the unknown factors bearing on the fate of the concern. Usually it is possible to mark out the line of proximate action fairly accurately, while a simple general indication does for remote activities, for before the moment for their execution has arrived sufficient enlightenment will have been forthcoming to settle the line of action more precisely. When the unknown factor occupies a relatively very large place there can be no preciseness in the plan, and then the concern takes on the name of venture.

Unity, continuity, flexibility, precision: such are the broad features of a good plan of action.

As for other specific points which it should have, and which turn on the nature, importance and condition of the business for which the plan is drawn up, there could be no possibility of settling them beforehand save by comparison with other plans already recognized as effective in similar businesses. In each case, then, comparable elements and models must be sought in business practice, after the fashion of the architect with a building to construct. But the architect, better served than the manager, can call upon books, courses in architecture, whereas there are no books on plans of action, no lessons in foresight, for management theory has yet to be formulated.

There is no lack of good plans, they can be guessed at from the externals of a business but not seen at sufficiently close quarters to be known and judged. Nevertheless, it would be most useful for those whose concern is management to know how experienced managers go about drawing up their plans. By way of information or sample, I am going to set out the method which has long been followed in a great mining and metallurgical concern with which I am well acquainted.

Method of Drawing up the Plan of Action in a Large Mining and Metallurgical Firm. This company includes several separate establishments and employs about ten thousand personnel.

The entire plan is made up of a series of separate plans called forecasts; and there are yearly forecasts, ten-yearly forecasts, monthly, weekly, daily forecasts, long-term forecasts, special forecasts, and all merge into a single programme which operates as a guide for the whole concern.

(i) *Yearly Forecasts.* Each year, two months after the end of the budgetary period, a general report is drawn up of the work and results of this period. The report deals especially with production, sales, technical, commercial, financial position, personnel, economic consequences, etc. The report is accompanied by forecasts dealing with those same matters, the forecasts being a kind of anticipatory summary of the activities and results of the new budgetary period. The two months of the new plan which have elapsed are not left without plan, because of provisional forecasts drawn up fifteen days before the end of the previous period. In a large mining and metallurgical firm not many activities are quite completed during the course of one year. Co-operative projects of a technical, commercial, and financial nature, which provide the business with its activities need more time for their preparation and execution. From another aspect, account must be taken of the repercussions which proximate activities must have on ultimate ones and of the obligation to prepare far ahead sometimes for a requisite state of affairs.

Finally, thought must be given to constant modifications operating on the technical, commercial, financial and social condition of the industrial world in general and of the business in particular, to avoid being overtaken by circumstances. These various considerations come outside the framework of yearly forecasts and lead on to longer-term ones.

(ii) *Ten-yearly Forecasts.* Ten-yearly forecasts deal with the same matters as yearly ones. At the outset these two types of forecast are identical, the yearly forecast merging into the first-year of the ten-yearly one, but from the second year onwards notable divergences make their appearance. To maintain unity of plan each year the ten-yearly forecasts must be reconciled with annual ones so that at the end of some years the ten-yearly forecasts are generally so modified and transformed as to be no longer clear and need re-drafting. In effect the custom of re-drafting every five years has become established.

It is the rule that ten-yearly forecasts always embrace a decade, and that they are revised every five years. Thus there is always a line of action marked out in advance for five years at least.

YEARLY AND TEN-YEARLY FORECASTS

CONTENTS

Technical section

Mining rights. Premises. Plant.
Extraction. Manufacture. Output.
New workings. Improvements.
Maintenance of plant and buildings.
Production costs.

Commercial section

Sales outlets.
Marketable goods.
Agencies. Contracts.
Customers. Importance. Credit standing.
Selling price.

Financial section

Capital. Loans. Deposits.
Circulating assets { Supplies in hand.
Finished goods.
Debtors.
Liquid assets.
Available assets.
Reserves and sundry appropriations.
Creditors { Wages.
Suppliers.
Sundry.
Sinking funds. Dividends. Bankers.

Accounting

Balance sheet. Profit and Loss account. Statistics.

Security

Accident precautions.
Works police. Claims. Health service.
Insurance.

Management

Plan of action.
Organization of personnel. Selection.
Command.
Co-ordination. Conferences.
Control.

(iii) *Special Forecasts.* There are some activities whose full cycle exceeds one or even several ten-yearly periods, there are others which, occurring suddenly, must sensibly affect the conditions of the business. Both the one and the other are the object of special forecasts whose findings necessarily have a place in the yearly and ten-yearly forecasts. But it must never be lost sight of that there is one plan only.

These three sorts of forecast, yearly, ten-yearly, and special, merged and harmonized, constitute the firm's general plan.

So, having been prepared with meticulous care by each regional management, with the help of departmental management, and then revised, modified, and completed by general management and then submitted for scrutiny and approval to the Board of Directors, these forecasts become the plan which, so long as no other has been put in its place, shall serve as guide, directive, and law for the whole staff.

Fifty years ago I began to use this system of forecasts, when I was engaged in managing a colliery, and it rendered me such good service that I had no hesitation in subsequently applying it to various industries whose running was entrusted to me. I look upon it as a precious managerial instrument and have no hesitation in recommending its use to those who have no better instrument available. It has necessarily some shortcomings, but its shortcomings are very slight compared with the advantages it offers. Let us glance at these advantages and shortcomings.

Advantages and Shortcomings of Forecasts

(a) The study of resources, future possibilities, and means to be used for attaining the objective call for contributions from all departmental heads within the framework of their mandate, each one brings to this study the contribution of his experience together with recognition of the responsibility which will fall upon him in executing the plan.

Those are excellent conditions for ensuring that no resource shall be neglected and that future possibilities shall be prudently and courageously assessed and that means shall be appropriate to ends. Knowing what are its capabilities and its intentions, the concern goes boldly on, confidently tackles current problems

and is prepared to align all its forces against accidents and surprises of all kinds which may occur.

(b) Compiling the annual plan is always a delicate operation and especially lengthy and laborious when done for the first time, but each repetition brings some simplification and when the plan has become a habit the toil and difficulties are largely reduced. Conversely, the interest it offers increases. The attention demanded for executing the plan, the indispensable comparison between predicted and actual facts, the recognition of mistakes made and successes attained, the search for means of repeating the one and avoiding the other—all go to make the new plan a work of increasing interest and increasing usefulness.

Also, by doing this work the personnel increases in usefulness from year to year, and at the end is considerably superior to what it was in the beginning. In truth, this result is not due solely to the use of planning but everything goes together, a well-thought-out plan is rarely found apart from sound organizational, command, co-ordination, and control practices. This management element exerts an influence on all the rest.

(c) Lack of sequence in activity and unwarranted changes of course are dangers constantly threatening businesses without a plan. The slightest contrary wind can turn from its course a boat which is unfitted to resist. When serious happenings occur, regrettable changes of course may be decided upon under the influence of profound but transitory disturbance. Only a programme carefully pondered at an undisturbed time permits of maintaining a clear view of the future and of concentrating maximum possible intellectual ability and material resources upon the danger.

It is in difficult moments above all that a plan is necessary. The best of plans cannot anticipate all unexpected occurrences which may arise, but it does include a place for these events and prepare the weapons which may be needed at the moment of being surprised. The plan protects the business not only against undesirable changes of course which may be produced by grave events, but also against those arising simply from changes on the part of higher authority. Also, it protects against deviations, imperceptible at first, which end by deflecting it from its objective.

✓/ *Conditions and Qualities Essential for Drawing up a Good Plan of Action*

To sum up: the plan of action facilitates the utilization of the firm's resources and the choice of best methods to use for attaining the objective. It suppresses or reduces hesitancy, false steps, unwarranted changes of course, and helps to improve personnel. It is a precious managerial instrument.

The question may be asked as to why such an instrument is not in general use and everywhere developed to the farthest extent. The reason is that its compilation demands of managerial personnel a certain number of qualities and conditions rarely to be found in combination. The compilation of a good plan demands for the personnel in charge—

- ✓ 1. The art of handling men.
- 2. Considerable energy.
- 3. A measure of moral courage.
- 4. Some continuity of tenure.
- ✓ 5. A given degree of competence in the specialized requirements of the business.
- ✓ 6. A certain general business experience.

(i) *The Art of Handling Men.* In a large firm the majority of departmental managers take part in the compiling of the working arrangements. The execution of this task from time to time is in addition to ordinary everyday work and includes a certain responsibility and does not normally carry any special remuneration. So, to have in such conditions loyal and active co-operation from departmental heads an able manager of men is needed who fears neither trouble nor responsibility. The art of handling men is apparent from keenness of subordinates and confidence of superiors.

(ii) *Energy.* Yearly and ten-yearly forecasts and special forecasts demand constant vigilance on the part of management.

(iii) *Moral Courage.* It is well known that the best-thought-out plan is never exactly carried out. Forecasts are not prophecies, their function is to minimize the unknown factor. Nevertheless, the public generally, and even shareholders best informed about the running of a business, are not kindly disposed towards a manager who has raised unfulfilled hopes, or allowed them to be raised. Whence the need for a certain

prudence which has to be reconciled with the obligation of making every preparation and seeking out optimum possible results.

The timid are tempted to suppress the plan or else whittle it down to nothing in order not to expose themselves to criticism, but it is a bad policy even from the point of view of self-interest. Lack of plan, which compromises smooth running, also exposes the manager to infinitely graver charges than that of having to explain away imperfectly executed forecasts.

(iv) *Continuity of Tenure.* Some time goes by before a new manager is able to take sufficient cognizance of the course of affairs, the usefulness of employees, the resources of the business, its general set-up and future possibilities, so as usefully to undertake the compiling of the plan. If, at such a moment, he feels that he will not have enough time to complete the work or only enough to start putting it into execution, or if, on the other hand, he is convinced that such work, condemned to bear no fruit, will only draw criticism upon him, is it to be thought that he will carry it out enthusiastically or even undertake it unless obliged? Human nature must be reckoned with. Without continuity of tenure on the part of management personnel there can be no good plan of action.

(v and vi) *Professional Competence and General Business Knowledge.* These are abilities just as necessary for drawing up a plan as for carrying it out.

Such are the conditions essential for compiling a good plan. They presuppose intelligent and experienced management. Lack of plan or a bad plan is a sign of managerial incompetence. To safeguard business against such incompetence—

1. A plan must be compulsory.

2. Good specimen plans must be made generally available. (Successful businesses could be asked to furnish such specimens. Experience and general discussion would single out the best.)

3. Planning (as a subject) must be introduced into education.

Thus could general opinion be better informed and react upon management personnel, so that the latter's inefficiency would be less to be feared—a state of affairs which would in no wise detract from the importance of men of proven worth.

I shall not here go into detail about monthly, weekly or daily forecasts which are in use in most businesses and which,

like long-term forecasts, aim at marking out beforehand the line of action judged to be most conducive to success. All these forecasts must be made available early enough to allow time to prepare for their execution.

Planning on a National Scale

The French nation is far-seeing, its government is not. Let us first establish this fact, then we will look for the remedies. The traditional nest-egg leaves no doubt as to the foresight of the less fortunate portion of the French population: it saves in order to improve its position and fortify itself against future rainy days. Compliments paid it on this subject prove that the custom is not universal. This foresight reveals a faculty for self-imposed privations in order to attain an objective; it demands no great intellectual effort. The home life of skilled workers and foremen is frequently a model of foresight and organization of which the wife is the chief contriver, and the purpose is a desire for social betterment, at least for the children. The plan demands straightway some calculations, but the head of the household can retain it mentally. In small industrial or commercial concerns more complex matters require further foresight. Those bereft of this capacity pay dearly for it. Tribute is generally paid to our middle-class virtues. We know what the importance of foresight is in big businesses and what qualities it demands of managerial personnel: special competence, experience, managerial ability, energy, moral courage, and this combination of qualities is to be found in the majority of large French concerns.

But, as far as we can judge from reading parliamentary debates, the same cannot be said for the French State. The annual forecasts (budget) are rarely completed early enough to be of use and long-term forecasts are rare, and in this immense undertaking demanding great foresight life is somewhat from hand to mouth—why? The immediate cause is instability of tenure on the part of Ministers. Ministers who come and go have no time to acquire professional competence, business experience and managerial capacity indispensable to the drawing up of a plan. Platform eloquence, undoubtedly of prime necessity for a Minister, does not absolve him from

having knowledge conferred after a time by holding office and wielding authority. A certain permanence is essential. Lack of stability of ministerial tenure is a thorn in the country's flesh. The day when public opinion is thoroughly convinced of this, the political parties, realizing that the game has grown dangerous, will no longer indulge in it so lightly as they do to-day.

A further reason for the State's lack of foresight is the absence of sense of responsibility on the part of leaders; financial responsibility, for instance, that powerful stimulus to heads of private concerns is almost non-existent in the case of the State. The remedy for this ill, too, lies in stability of ministerial tenure, for this ties a Minister to his work and gives him moral responsibility, sole true guarantee of management in large businesses. So merely from the planning aspect the utmost effort must be made to attain stability of ministerial tenure.

2. ORGANIZING

To organize a business is to provide it with everything useful to its functioning: raw materials, tools, capital, personnel. All this may be divided into two main sections, the material organization and the human organization. The latter only is to be dealt with here. When equipped with the essential material resources the personnel or body corporate should be capable of fulfilling the six essential functions, viz. of carrying out all the activities embraced by the concern.

Managerial Duties of an Organization

Between the body corporate of the one-man business, where one man performs all functions, and that of a national concern employing millions of people, there are to be found all possible intermediate stages. In every case the organization has to carry out the following managerial duties—

1. Ensure that the plan is judiciously prepared and strictly carried out.
2. See that the human and material organization is consistent with the objective, resources, and requirements of the concern.
3. Set up a single, competent energetic guiding authority.

4. Harmonize activities and co-ordinate efforts.
5. Formulate clear, distinct, precise decisions.
6. Arrange for efficient selection—each department must be headed by a competent, energetic man, each employee must be in that place where he can render greatest service.
7. Define duties clearly.
8. Encourage a liking for initiative and responsibility.
9. Have fair and suitable recompense for services rendered.
10. Make use of sanctions against faults and errors.
11. See to the maintenance of discipline.
12. Ensure that individual interests are subordinated to the general interest.
13. Pay special attention to unity of command.
14. Supervise both material and human order.
15. Have everything under control.
16. Fight against excess of regulations, red tape and paper control.

Such is the mission of management to be fulfilled by the personnel of every business. It is simple in the one-man business, more complex as the enterprise grows more important and its personnel more numerous.

We shall first establish that despite infinite variety of businesses every body corporate of similar numerical strength shows strong external resemblances to every other one and differs chiefly in the nature and relative value of the constituent elements. Then we shall consider the functioning parts of the body corporate together with the individuals composing such parts, and we shall seek to discover what conditions both must fulfil for the body corporate to be soundly constructed. Finally, we shall concern ourselves with the selection and training of business personnel.

Composition of the Body Corporate

(A) Form of the body corporate at various stages of development—similarities—importance of the human factor—analogies.

The general form of an organization depends almost solely on the number of its employees. First let us consider the industrial concern represented at its various stages of development by the diagrams in Table VI.

(a) Represents the solitary craftsman of the one-man business.

(b) Represents the personnel of a small business, where merely a few workers receive instructions direct from the head.

(c) When the number of workers rises to ten, twenty, thirty, as the case may be, a foreman, i.e. intermediary, comes between the head of the group or some of the workers. Then the organization takes on the form (c).

(d) to (g) Each fresh group of ten, twenty, thirty workers brings in a fresh foreman; two, three or four foremen make necessary a superintendent, two or three superintendents give rise to a departmental manager, and the number of links of the scalar chain continues to increase in this way up to the ultimate superior, each new superior having usually no more than four or five immediate subordinates. On the basis of fifteen workers to a foreman and four superiors of rank S^n to every superior S^{n+1} the number of workers in a concern will be as follows—

| | | |
|----------|----------|-------------|
| Superior | S | 15 |
| | S^1 | 60 |
| | S^2 | 240 |
| | S^3 | 960 |
| | S^4 | 3,840 |
| | S^5 | 15,360 |
| | S^6 | 61,440 |
| | S^7 | 245,760 |
| | S^8 | 983,040 |
| | S^9 | 3,932,160 |
| | S^{10} | 15,728,640 |
| | S^{11} | 62,914,560 |
| | S^{12} | 251,658,240 |

I quote these figures, those of a simple geometrical progression whose first term is 15 and common ratio 4, to show that the normal form of development of the organization lends itself well to the grouping of any number of employees and that the number of levels of authority in the largest business concerns is quite small. If each level were to be indicated by a stripe the number of stripes of the highest industrial leaders would not exceed eight or nine and in the case of the highest political or religious leaders, ten or twelve.

The personnel of enterprises of all kinds is constituted in similar fashion to that of industrial concerns, so much so that all organizations at the same stage of expansion are alike. This likeness is explained by the fact of there being identity

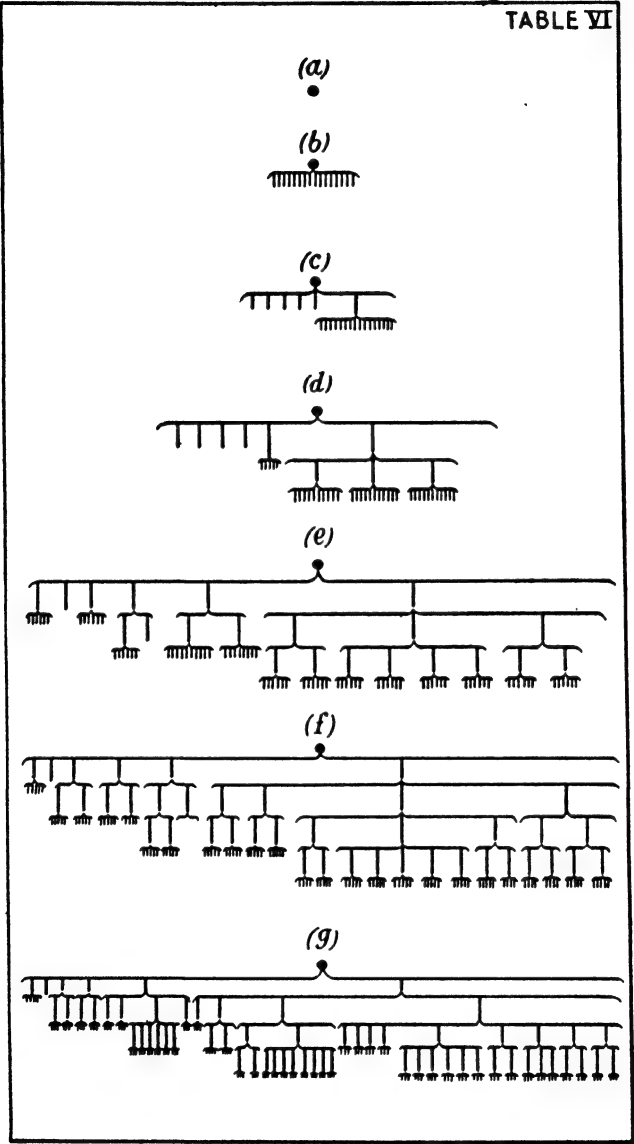


TABLE VI
FORM OF THE ORGANIZATION AT VARIOUS STAGES OF EXPANSION

of functions in business of the same type, or else a preponderance of similar functions in enterprises of different types. There is total resemblance in business of the same kind, partial but well marked resemblances in the rest.

As an example, here are two diagrams (Tables VII and VIII) showing the framework of two individual concerns of different order, a colliery and a metallurgical works, each employing between two and three thousand workers. There is the same general appearance, same main divisions bearing the same names, save that the technical activity is called manufacture in one case and extraction in the other. The same framework is appropriate for all industrial concerns, of whatever kind, employing the same number of people.

In industrial concerns it is the technical aspect which is of greatest importance; were it a case of commercial concerns then it would be the commercial aspect, or in the army the military aspect, in the school the teaching aspect, in the church the religious aspect. The most highly developed organ is that of the professional function which is characteristic of the enterprise. But, regarded as a whole, the body corporate, given the same stage of development, always retains the same general appearance.

The same general appearance, however, does not imply the same detailed structure nor the same organic quality. Of two organizations similar in appearance, one may be excellent the other bad, depending upon the personal qualities of those who compose them. If it were possible to ignore the human factor it would be easy enough to build up a social organic unit. Any novice could do it, provided he had some idea of current practices and could count on the necessary funds. But to create a useful organization it is not enough to group people and distribute duties; there must be knowledge of how to adapt the organic whole to requirements, how to find essential personnel and put each where he can be of most service; there are in sum numerous important qualities needed.

The body corporate of a concern is often compared with a machine or plant or animal. The expressions, "administrative machine," "administrative gearing," suggest an organism obeying the drive of its head and having all its effectively interrelated parts move in unison and towards the same end, and that is excellent. But such expressions might also suggest

that, like the mechanical gearing, the administrative one is incapable of transmitting movement without losing power. And that is a false concept: the administrative gearing—i.e. every intermediate executive—can and must be a generator of power and of ideas. In each of these gearings, that is in each intermediary, there exists a power of initiative which, properly used, can considerably extend the supreme authority's power of action. So it is not merely in dissipation of initial power through the multiplicity of transmission mechanisms that limits must be sought for the activity within an administrative whole. It is rather to be sought in the inadequacy of higher authority. When power at the centre is weak, centrifugal force holds sway.

Plant life too has served for numerous comparisons with social units. In the realm of growth there spring from the young single trunk branches which spread out and grow leaves, and the sap brings life to all branches, even the slenderest twigs, just as higher authority transmits activity right down to the lowest and farthest extremities of the body corporate. Trees "do not grow right up into the sky" and corporate bodies too have their limiting factors. Is it insufficient climbing power of the sap in the first instance and insufficient managerial capacity in the second? But, a measure of strength which the tree cannot attain by its isolated growth may result from grouping and juxtaposition—namely the forest. That is what business obtains by agreements, agencies, trusts, federations. Each industrial unit, keeping a fair measure of autonomy, makes to the common whole a contribution which is largely returned to it.

Over and above a certain size—only exceeded with difficulty—grouping by juxtaposition is the means whereby powerful associations are formed and strong units and collective organizations developed with the expenditure of minimum administrative effort.

But it is to the animal sphere that the social organism is most often compared. Man in the body corporate plays a rôle like that of the cell in the animal, single cell in the case of the one-man business, thousandth or millionth part of the body corporate in the large-scale enterprise. As the development of the organism is effected by the grouping together of elemental units (men or cells) the organs appear, they are differentiated

TABLE VII

WORKS

| | | | | |
|--|--|---|------------------------------|---------------------------------|
| Management Manager and his Staff | Manufacture Chief Engineer | Blast Furnaces Departmental Manager | { Stock Manufacture | Supervisor Head Fore- man |
| | | Steel Works Departmental Manager | { Thomas Martin | Engineer " |
| | | Rolling Mills Departmental Manager | Reversible Mills | " |
| | | | Medium Mills | " |
| | | | Small Mills | " |
| | Maintenance, Construction, and Sundry Departmental Manager | Flattening Mills | Foreman | |
| | | Roller-turning Shop | " | |
| | | Laboratories and Test Shops | Chemist | |
| | | Commercial Department Departmental Manager | Maintenance and Buildings | Head Clerk |
| | | | Electrical | Foreman |
| | Accounting Departmental Manager | Cash Department | Purchases | Head Clerk |
| | | | Sales | " |
| | | | Warehouse | Warehouse- man |
| | | Sundry | Technical | Head Clerk |
| | | | Commercial | " |
| | | | Claims | Departmental Mgr. |
| | | | Medical Service | Doctors |
| | | | Police | Watchmen. |

and perfected in proportion as the number of combined elements increases. In the social organism, as in the animal, a small number of essential functional elements account for an infinite variety of activities. Countless approximations may be made between the functions of the two kinds of organic units. The nervous system in particular bears close comparison with the managerial function. Being present and active in every organ, it normally has no specialized member and is not apparent to the superficial observer, but everywhere it receives impressions which it transmits first to the lower centres (reflexes) and thence, if need be, to the brain or organ of direction. From these centres or from the brain the order then goes out in inverse direction to the member or section concerned with carrying out the movement. The body corporate, like the animal, has its reflex responses or ganglia which take place without immediate intervention on the part of the higher

TABLE VIII

COLLIERY

| | | | | | |
|---|---|--|-------------------|--------------|----------|
| Extraction Chief Engineer | { | Underground Works | { | 1st Division | Engineer |
| | | Quarries | 2nd Division | " | |
| | | | 3rd Division | " | |
| | | | 4th Division | " | |
| | { | Mechanical Prepara- tion Departmental Manager | Plans | Chief Clerk | |
| | | | Separating | Supervisor | |
| | | | Washing | " | |
| | | | Bulking | " | |
| | { | Transport Departmental Manager | Coking | " | |
| | | | Laboratory | Chemist | |
| Railways | | | Supervisor | | |
| Vehicles | | | " | | |
| Maintenance, Construction, and Sundry Departmental Manager | { | Mechanical | Engineer | | |
| | | Electrical | " | | |
| | | Buildings and Roads | " | | |
| Commercial Department Departmental Manager | { | Purchases | Head Clerk | | |
| | | Sales | " | | |
| | | Warehouse | Warehouseman | | |
| Accounting Departmental Manager | { | Technical | Head Clerk | | |
| | | Commercial and General | " | | |
| Cash Department | | | | Cashier | |
| Sundry | { | Claims | Departmental Mgr. | | |
| | | Medical Ser- vice | Doctors | | |
| | | Police | Watchmen | | |

authority and without nervous or managerial activity the organism becomes an inert mass and quickly decays.

(B) Organs or Members of the Body Corporate

These are the organs of the six essential functions. In the one-man business they may be represented by one person only; in national enterprise the highly complex and sub-divided essential functions involve many people and lead to the development of numerous organs and sub-organs. To study the organs of an undertaking I shall first take as example a large industrial concern, mining and metallurgical, organized on the limited liability principle and employing about ten thousand people. Table IX shows the framework of its personnel. Reading

from left to right there are first the shareholders, then the Board of Directors, then general management. Up to that point authority has been increasingly concentrated at each stage of its transmission. After that, it becomes more diffuse and extends to the extreme confines of the business, going via regional and local management and sundry departmental heads. The following members of the body corporate of the company may be identified—

1. Shareholders.
2. Board of Directors.
3. General management and its staff.
4. Regional and local management.
5. Chief engineers.
6. Technical (departmental) managers.
7. Superintendents.
8. Foremen.
9. Operatives.

1. Shareholders

Their rôle is very restricted and consists chiefly in—

(a) Appointing members of the Board of Directors and Auditors.

(b) Considering the Board's recommendations.

They meet at least once a year and their most important and most difficult task is the appointment of Directors.

2. Board of Directors

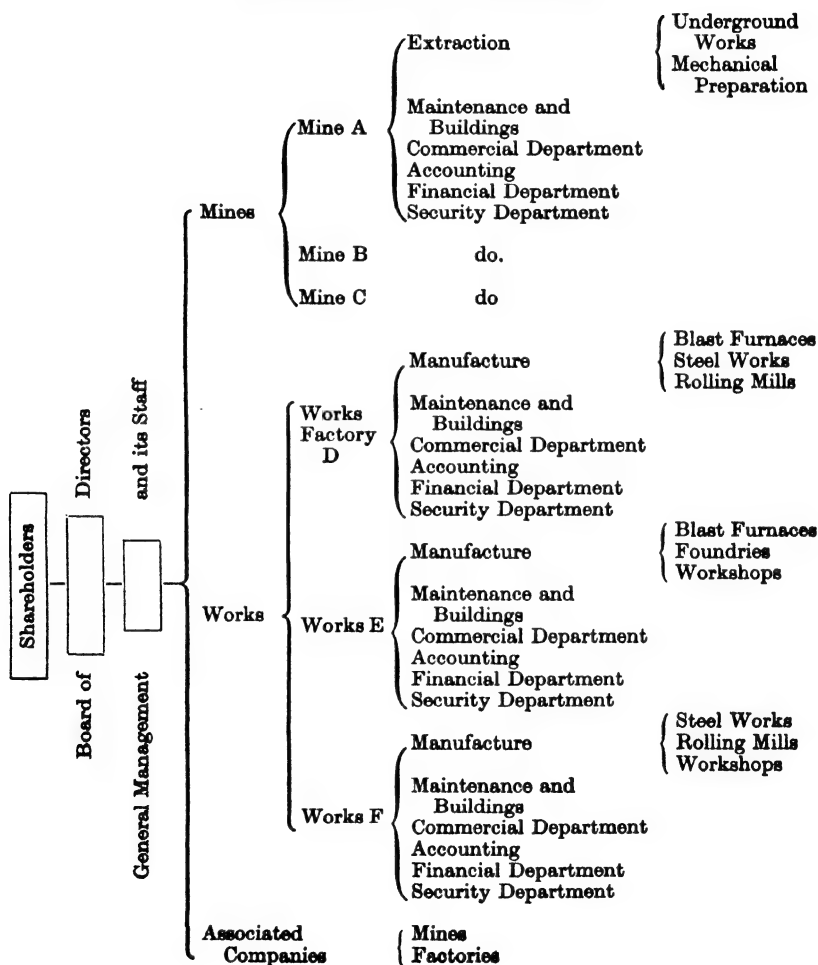
The Board has wide statutory powers which are collective and a large part of which it normally delegates to general management appointed by it. The Board must be in a position to assess the proposals of the general management and exercise control in a general way. Table V sets out the diverse abilities demanded of the Board.

3. General Management

The responsibility of general management is to conduct the enterprise towards its objective by making optimum use of

available resources. It is the executive authority, it draws up the plan of action, selects personnel, determines performance, ensures and controls the execution of all activities. It may comprise now one, now several, general managers. The solitary general manager may be in direct contact either with local managers or with intermediaries (heads of groups of establishments or heads of general, technical, commercial

TABLE IX
A LARGE INDUSTRIAL UNDERTAKING



departments, etc.). When there are several general managers, the duties appertaining to general management may be divided in a variety of ways. Unity offers over plurality the advantage of making easier unity of outlook, action and command and it tends to prevail. But in such things the personal quality of the men has an enormous importance outweighing the system. In every case general management is supported by a staff.

Staff. The staff is a group of men equipped with the strength, knowledge and time which the general manager may lack, and is an adjunct, reinforcement and sort of extension of the manager's personality. There are no levels of authority in it and it takes orders only from the general manager. Such a group is known as general staff in the army and I have kept this name for lack of any other which might have proved preferable.

Such an organ is intended to sub-serve the manager in carrying out his personal duties. If it is possible for him to carry out all his obligations unaided he requires no staff, but if his own energies or knowledge are insufficient, or his time too limited, he is obliged to have help and those who come to his help in this way constitute his staff.

Now, there are very few higher managers able to deal at one and the same time with—

1. Their daily obligations of correspondence, interviews, conferences and sundry activities.
2. Command and control.
3. Various investigations demanded by preparation of future, and harmonizing of current, plans.
4. Searching for improvements constantly to be introduced into every sphere of activity.

Hence staffs of various composition are to be found in the majority of large-scale industrial concerns: secretaries, consultants (engineering, legal, financial, accounting) consultative committees, research groups, laboratories, etc.

So that they may be entirely at the manager's disposal and free of other responsibilities the members of the staff take no executive part in subordinated departments. But nothing precludes the same person's being attached to the staff for part of his time and to some department or other for another part

of it. Nor does anything preclude a member's not being exclusively attached to the business. A particular consultant, for instance, may quite usefully give his service to the staff for an hour a day, or week, or month. The constitution and functioning of the staff lend themselves to a variety of procedures, and it is sufficient that it be entirely at the manager's disposal and that, thanks to its assistance, all the duties of management shall be performed.

Development. Of these duties one of the most important is the search for improvements. It is well known that a business which does not go forward is soon behind its competitors, and that consequently progress in every sphere must be pursued unremittingly. To effect improvements, method, ability, time, determination and financial backing are required. Method consists in observing, collecting and filing facts, interpreting them, trying out experiments if need be, and from the study as a whole, deducing rules which, under the management's impetus, may be introduced into business practice. Most developments which have raised business science to its present level emanate from this same method, which in actual fact is none other than the Cartesian one. Evidently it is not sufficient merely to know the definition of the method in order to use it effectively; in addition there must be innate abilities developed by experience. Competence in this context is intended to mean a fairly thorough knowledge of the way in which research is brought to bear, but the best informed manager cannot be really competent on all questions of different kinds thrown up by the managing of a vast concern. Managers, absorbed by current work and by weighty questions calling for immediate settlement, have not usually the requisite time to devote themselves to development research. It is acknowledged that they have the determination to keep the business abreast of progress and that the business allows them to have all the necessary financial backing at their disposal.

Such then is the assemblage of factors whose operation must be combined in order to lead to the discovery of improvements in one or other of the manifold material or human organs of a big concern, and this course must be pursued unceasingly at all levels and throughout all parts of the business. Therefore the head (whether of the whole business, or

department, or workshop) must have an active, unrelenting intention to effect improvements and also must have sufficient credit available to pursue the necessary investigations, but, having neither all the time nor all the specialist abilities required for such research, he must have recourse to a staff. In a large mining and metallurgical concern, for instance, this is represented by specialist consultants (metallurgists, mining engineers, civil engineers, architects, electrical engineers, geologists, chemists, lawyers, accountants) grouped around the general manager, some wholly attached to the concern, others giving only a part of their time. In local management the staff is represented by technical secretaries, special assistants, research groups, laboratories, etc. And it is by close and unbroken collaboration of executives with staff that the major part of the countless improvements filling the pages of technical publications is brought into effect.

4. Regional and Local Management

The group of establishments under one general management represents a continuation of the large-scale industrial unit. The industrial unit, as commonly understood, is an agricultural concern, mine, works, or workshop with its head. There are small units, medium-sized ones, large and very large ones. In the small and medium-sized unit the manager is usually in contact with all departmental heads; in a large works there is frequently a chief engineer, acting as intermediary between the manager and the heads of the technical departments. The local manager's powers depend both on the particular circumstances and on the relative division of powers as between general and local management. Sometimes these powers verge on autonomy, sometimes they are quite restricted. The qualities and knowledge required follow naturally from such powers. We already know from Tables I and V that the manager of a large industrial concern must be primarily a manager, must be possessed of a fair measure of technical capacity and in a position to further the working of the four other essential functions. In the majority of local managements there is a staff embracing administrative and technical secretaries, consultants, research groups, and laboratories.

The Taylor System

I have tried to formulate for myself a fairly precise conception of the system of organization known as the Taylor system, so much discussed of recent years. It is not easy: to some, it conveys arrangement of workers' jobs based on a close and detailed scrutiny of time and movement; to others, it means high-speed steel or else accounting and wages payment methods. Probably it is something of all this, but it seems to me that it is above all what Taylor himself called "scientific or functional management," and described at length in one of his latest works in the following terms¹—

One of the most difficult works to organize is that of a large engineering establishment building miscellaneous machinery, and the writer has therefore chosen this for description.

Practically all the shops are organized upon what may be called the military plan. The orders from the general are transmitted through the colonels, majors, captains, lieutenants and non-commissioned officers to the men. In the same way the orders in industrial establishments go from the manager through superintendents, foremen of shops, assistant-foremen and gang-bosses to the men. In an establishment of this kind the duties of the foremen, gang-bosses, etc., are so varied and call for an amount of special information coupled with such a variety of natural ability, that only men of unusual qualities to start with, and who have had years of special training, can perform them in a satisfactory manner. It is because of the difficulty (almost the impossibility) of getting suitable foremen and gang-bosses, etc., more than for any other reason, that we so seldom hear of a miscellaneous machine works starting on a large-scale and meeting with much, if any, success for the first few years.

* * * *

"In the writer's experience almost all shops are under-officered. . . .

"Under the military type of organization, the foreman is held responsible for the successful running of the entire shop. . . .

"He must be a good machinist. . . . He must be able to

¹ "Shop Management" (Translated in the *Metallurgy Review*, Paris, 1913).

read drawings readily and have sufficient imagination to see the work in its finished state clearly before him. . . . He must plan ahead and see that the right jigs, clamps and appliances, as well as proper cutting tools, are on hand, and are used to set the work correctly in the machine and cut the metal at the right speed and feed. He must see that each man keeps his machine clean and in good order. . . . He must see that each man turns out work of the proper quality. . . . He must see that the men under him work steadily and fast. . . . He must constantly look ahead over the whole field of work and see that the parts go to the machines in their proper sequence and that the right job gets to each machine. . . . He must, at least in a general way, supervise the timekeeping and fix piecework rates. . . . He must discipline the men under him and re-adjust their wages. . . .

"It is evident then that the duties which the ordinary gang-boss is called to perform would demand of him a large proportion of the nine attributes mentioned above; and if such a man could be found, he should be made manager or superintendent of a works instead of gang-boss. However, bearing in mind the fact that plenty of men can be had who combine four or five of these attributes, it becomes evident that the work of management should be so sub-divided that the various positions can be filled by men of this calibre and a great part of the art of management undoubtedly lies in planning the work in this way. This can, in the judgment of the writer, be best accomplished *by abandoning the military type of organization* and introducing two broad and sweeping changes in the art of management.

"First: As far as possible the workmen, as well as the gang-bosses and foremen, should be entirely relieved of the work of planning, and of all work which is more or less clerical in its nature.

"Second: Throughout the whole field of management the military type of organization should be abandoned and what may be called the 'functional type' substituted in its place.

"'Functional management' consists in so directing the work of management that each man from the assistant superintendent down shall have as few functions as possible to perform. . . . Under the ordinary or military type the workmen are

divided into groups. The men in each group receive their orders from one man only, the foreman or gang-boss of that group. This man is the single agent through which the various functions of the management are brought into contact with the men. Certainly the most marked outward characteristic of 'Functional Management' lies in the fact that each workman, instead of coming in direct contact with the management at one point only, namely through his gang-boss, receives his daily orders and help directly from eight different bosses, each of whom performs his own particular function. . . .

"Thus we see, under functional foremanship, the work which, with the military type of organization, was done by the single 'gang-boss' subdivided among eight men—route clerks, instruction card men, cost and time clerks, who plan and give directions from the planning room; gang-bosses, speed bosses, inspectors, repair bosses, who show the men how to carry out their instructions and see that the work is done at the proper speed; and the 'shop disciplinarian' who performs this function for the entire establishment. . . .

"Functional foremanship is already in limited use in many of the best managed shops. A number of managers have seen the practical good that arises from allowing two or three men especially trained in their particular lines to deal directly with the men instead of at second-hand through the old-style gang-boss as a mouthpiece."

Such is the system of organization as conceived by Taylor for running the workshops of a large mechanical engineering concern. It turns on the two following ideas—

- (a) Need for a staff to help out shop foremen and foremen.
- (b) Negation of the principle of unity of command.

Just as the first seems to me to be good; so the second seems unsound and dangerous.

(a) Need for a Staff to Help out Shop Foremen and Foremen

Taylor, better than anyone else, demonstrated the complexity and weight of the responsibility laid upon the men in charge of a large mechanical engineering shop. They cannot carry out their work satisfactorily unless given help. To attain his

objective, Taylor devised and carried out the foregoing procedure: sundry specialists are attached to the foreman, who absolve him from having to have special knowledge at his command, and relieve him of the innumerable interruptions which would occupy too great a part of his time. This is the work of the staff. Such a mechanism is not necessary only in mechanical engineering workshops; the necessity is also apparent in the repair shops of large mining, metallurgical, or other concerns and may be observed too in workshops of all kinds. Hitherto the need has been met in a variety of ways, but rarely satisfactorily. I consider that Taylor has rendered great service in drawing attention to the importance of such a mechanism and to the manner of instituting it.

(b) Negation of the Principle of Unity of Command

According to Taylor the ordinary type of organization referred to somewhat scornfully by him as "military," wherein workers receive instructions from one man only—shop foreman or gang-boss—is to be abandoned. ". . . So deep-rooted, however, is the conviction that the very foundation of management rests in the military type as represented by the principle that no workman can work under two bosses at the same time that . . . the writer has never yet found one except among the works which he had assisted in organizing, who came out squarely and acknowledged that he was using functional foremanship because it was the right principle." According to Taylor himself some adherents to the principle of unity of command would not abjure it even at his instance. For myself I do not think that a shop can be well run in flagrant violation of this. Nevertheless, Taylor successfully managed large-scale concerns. How, then, can this contradiction be explained? I imagine that in practice Taylor was able to reconcile functionalism with the principle of unity of command, but that is a supposition whose accuracy I am not in a position to verify. In business matters, day in and day out, from top to bottom of the scalar chain, functionalism has to be reconciled with unity of command. Considerable ability is demanded and this Taylor must have had in good measure.

I think it dangerous to allow the idea to gain ground that

unity of command is unimportant and can be violated with impunity. So, until things change, let us treasure the old type of organization in which unity of command is honoured. It can, after all, be easily reconciled, as recommended by Taylor, with the assistance given to superintendents and foremen.

My reservations as regards Taylor's scientific or functional management do not prevent me from admiring the inventor of high-speed steel, the pioneer of minute and precise methods in conditions of work, the energetic and adept industrialist who, having made discoveries, shrank from no effort nor spared any pains to make them of practical application, and the tireless propagandist who meant the world to profit from his trials and experiments. We may hope that the example of the great American engineer may be followed in this respect by many of our own fellow countrymen.

5 to 9. Chief Engineers, Departmental Heads, Sub-departmental Heads, Superintendents, Foremen, Operatives

Tables VII and VIII indicate how in two different industries (coal mines and metallurgical works) there is the same series of organs under the management and that this series exists under diverse names in all large concerns of whatever kind. We already know that the managerial function, predominant at the top, gives place gradually to the technical function—technical, commercial or other, which is the chief preoccupation of the lower grades. Such are the main parts of a large mining and metallurgical concern. They are to be found in almost exactly the same form in all large industrial enterprises and also with some slight modifications in enterprises of all kinds; commercial, financial, military, political, religious and other.

(C) Employees or Constituent Elements of the Body Corporate

As before, I am using the large industrial concern as an example. In this type the following series of employees are required: operatives, foremen, superintendents, sub-departmental heads, departmental heads, chief engineers, managers, general managers. Just as quality of materials available

affects the shape and strength of a building, so the quality of employees in service affects the form and value of a human edifice. The shape and proportions of the organs and of the body corporate itself depend on the calibre of employees in service, so naturally the best possible employee should be found to perform each job.

First let us define the essential qualities of managers. Management and operation are merged in the one-man business, where all activities are carried out by the same person. In small concerns the head retains the management, for which he alone is responsible, but is relieved from carrying out many activities. As the concern grows, the operative aspect of the manager's work diminishes, whilst his function of managing becomes increasingly important and difficult. This part soon exceeds the capacities of a single person even with an excellent organization of subordinate departments. Then employees appear around the manager and their special function is to lighten his personal task, viz. administrative and technical secretaries, consultants on various subjects, liaison and control officials, consultative committees, etc.

In order to determine what qualities are indispensable to a business head, it is essential to be absolutely clear on the rôle the staff may have to play in business management. The ideal manager would be one who, possessed of all requisite knowledge for settling managerial, technical, commercial, financial and other questions before him, also enjoyed sufficient physical and mental vigour and capacity for work to be able to meet all the weight of business contacts, command and control incumbent upon management. Such an one might be found once in a while in small concerns; there are none to be found in large businesses, much less so in very large concerns. There is no man alive whose knowledge embraces every question thrown up in the running of a large concern, and certainly none possessed of the strength and disposing of the time required by the manifold obligations of large-scale management. Hence the need to fall back on the staff, wherein lies a reserve of physical and mental strength, competence, and time, on which the manager may draw at will. Staff work falls into four categories.

1. Divers assistance afforded to the manager in current

matters, correspondence, interviews, consideration and preparation of records.

2. Liaison and control.

3. Future projects, either drawing up plans or bringing them into line.

4. Development study.

All these come within the scope of management and, in the interests of the business, have to be done. It is for the manager to carry them out, either on his own or with staff assistance.

The first two classes of staff work are usually satisfactorily accomplished but future planning and the study of development—two important factors of success—are often deplorably neglected. It has not yet become established custom to regard the staff as an organ of thinking, studying and observation, whose chief function consists, under managerial impetus, in preparing for the future and seeking out all possible improvements. For the staff to acquit itself satisfactorily of this portion of its rôle it must be free of all responsibility for running the business.

No part of the organic unit makes greater demand on management for attention, judgment, experience, authority and sense of proportion. It is a service which he must institute in the interest—the sole interest—of the concern and which takes on somewhat of the appearance of a personal service, since it is intended to supplement what is deficient in him. It lends itself easily to abuse and evokes keen critical attention for which reason possibly not all its potential services are required of it.

Managers of Large Concerns. In seeking to determine the necessary abilities for business heads we have, then, to take into account both the authority and responsibility delegated to departmental heads and also the support which the head may find in his staff. We have noted, moreover, that the chief features of an efficient administration are almost exclusively managerial in character. It is acknowledged, indeed, that when foresight, organization, command, co-ordination, and control are effectively exercised throughout the concern, all duties will be duly performed and the running of the concern assured. Thence we may conclude that the first condition to be fulfilled by the head of a large business is that of being a good manager.

and knowledge requisite for managers of large concerns, six are made up of cognate elements, whatever the nature of the business, whilst only one, the seventh, comprises special features varying with each kind of concern. The common elements are health, physical fitness, intelligence, moral fibre, general education, general knowledge of all essential functions, and marked managerial ability.

The industrial, commercial, political, military, religious leaders of comparable rank are alike as far as the first six categories go, and differ only in the matter of specialized activity characteristic of the enterprise.

It is most frequently by this specialized ability that men who have become important heads first attracted attention ; particular mastery of their subject first distinguished them from their peers, and then, later, their general abilities carried them to the forefront. So it happens that professional success covers up general ability and the tendency persists to see in the outstanding industrialist merely the eminent technical man or capable business man, or in the head of the government merely the successful general or eloquent parliamentarian. Notwithstanding, the most brilliant specialized ability is not enough to make a good manager of an industrial concern. For a perfect leader there must be all the above-mentioned qualities and knowledge present to a high degree. The men approximating to such perfection are rare, weaknesses and even shortcomings must be allowed, but to what extent ?

Bad health may nullify all other qualities taken together ; similarly with inadequate mental powers. Knowledge on functional points, even those relating to the particular activity of the business, may be largely supplied via departmental heads and the staff, but nothing can make up for lack of managerial ability. The slightest moral flaw on the part of a higher manager can lead to most serious consequences, for high position in the scalar chain is as the arm of a lever whose length increases its power considerably ; good and bad qualities are a hundred times more important in a seven- or eight-striped leader than in a foreman.

Managers of Medium-sized and Small Concerns. Between the qualities and knowledge essential on the part of the head of a large concern—head of the State, even—and those essential

for an artisan who is head and sole worker of his business or trade, there are merely differences of degree. The self-same elements, but combined in different proportions, constitute the total make-up of both senior and junior managers. In the case of the manager of a large concern, not merely is managerial capacity the most important of all, but in itself alone outweighs in importance all other abilities taken together. Even so, total lack of one of the secondary abilities might be a serious handicap to a manager, true though it may be that he might remedy it via his staff. For the head of the one-man business technical capacity is the most important, namely that of the specialized activity of the business, but for such a head commercial and financial ability are relatively more important than for the head of a very large concern. Table IV shows the gradual changes operating in the relative importance of the various abilities necessary to the manager in proportion as the business expands or contracts. It must not be forgotten that this figure only indicates relative values and that there is scarcely anything in common between each ability in the case of the one-man head and the same ability in the case of the higher manager.

Departmental Heads. Underneath the series of superiors $S^1, S^2, S^3, S^4 \dots S^n$ is found the series of departmental superiors $SD^1, SD^2, SD^3 \dots SD^n$. The managers of the whole concern are responsible for that whole and must see that all functions are performed, whereas the responsibility of departmental managers extends only over a portion of the concern. Tables III and IV show that the evaluation of a departmental manager comprises the same elements as that of heads of businesses. Nevertheless, between a manager S^n and a departmental head of comparable rank SD^n there always remains this difference that the former's responsibility is total, and the latter's partial.

Lower Grades—Operatives. Even for the lower grades of a business the evaluation contains the same elements as in the case of higher managers, but the absolute importance of these elements in the assessment of the one and of the other is so different as scarcely to be recognizable at first sight as identical. We are going to glance over the divers elements which constitute the value of managers and workers and over the

proportions in which such elements enter into the evaluation of both the one and the other.

*Elements in the Evaluation of Managers and Workers
in Business Concerns*

(i) *Health and physical fitness.* Health is essential to all ranks of industry from operative to supreme head. Similarly, a certain physical fitness related to the work is essential for all.

(ii) *Intelligence and mental vigour.* Intelligence comprises ability to understand and assimilate plus judgment and memory. Mental vigour makes it possible either to bring thought to bear forcefully on an urgent matter or else to deal simultaneously with many varied manifold subjects. Intelligence and mental vigour are increasingly necessary as the work embraces more numerous, widespread and complex activities, and the higher manager requires a breadth of vision and flexibility of mind which is only slightly necessary for a foreman's activity and still less for an operative's. A bad memory considerably reduces mental powers.

(iii) *Moral qualities.* The term character is frequently used to cover moral qualities such as drive, steadfastness, straightness, and initiative, but on account of its lack of precision I have refrained from using it. Discipline, straightness, loyalty, are expected of all industrial employees of whatever rank. Initiative too is a precious gift in everyone, but more useful the higher the rank. As for steadfastness, sense of proportion, acceptance of responsibility, their importance increases with position, and they may be set at the head of the list of higher managers' attributes.

(iv) *General education.* This consists of general ideas not properly belonging to the sphere of the function performed. It is acquired partly at school, partly from everyday life. Men are to be found with only a primary school education who have risen to high industrial, commercial, political or military rank, and whose knowledge has always been equal to the occasion. Note, in passing, that all men who rise high need to improve their general education, and the university even hardly pays any more attention to it, over and above post-primary teaching.

(v) *Management knowledge.* This knowledge is concerned with planning, organizing, command, co-ordination, control; for the operative it is elementary, but very wide for employees of high rank, and especially so for managers of high rank. It is not taught at school and so must be learnt in the workshop, where empiricism reigns supreme, so it is not surprising that management education is generally inadequate. It seems to me that it is quite time to codify the data furnished by experience and place a body of theory within reach of all.

(vi) *Knowledge of the other functions.* Moving upward from operative to foreman, superintendent, and higher executives towards the general manager of an industrial concern, it is apparent that the number of special subjects or types of work with which each one has to do increases progressively. Usually the operative has only one type of job, the foreman's supervision spans four or five, the superintendent's eight or nine, the engineer's more. As for the general manager, he must have some conception not merely of the specialized technical activities of the concern, but also of the commercial, financial, and other functions with which he must deal.

It follows then that the foreman is usually less competent than each one of his workers at their particular jobs, that the superintendent is less competent than the foreman in the specialized work of each group, that the engineer is less competent than is the superintendent within his own sphere. As for the general manager he could lay no claim to be any better than each of his departmental heads in their respective spheres, but he should have broad ideas about all departments. The scope of knowledge increases with rank.

(vii) *Specialized ability characteristic of the concern.* This capacity, comprising almost the whole of an operative's evaluation, forms only a fourth or tenth part of the evaluation of a higher manager. It must not be forgotten that the term ability does not connote the same assemblage of qualities and knowledge at different levels of the scalar chain.

Organization Charts

Summarized charts after the fashion of Tables VII and VIII facilitate considerably the building up and supervising

of an organization. They enable the organic whole, departments and lines of demarcation and the line of authority, to be grasped at a glance better than could be done by lengthy description. They draw attention to weak points, such as overlapping or encroachment of departments, dual command, functions unstaffed or with no clearly indicated single head. This mode of representation is suitable for all types of concern, large establishments as well as small, expanding or declining, as well as newly-formed businesses. In the latter case the organization chart is a frame divided into compartments in which employees' names are to be written as and when they are selected and the departments decided upon. The use of the summarized chart is not confined to the period of formation of a business, for scarcely is that task accomplished when modifications, as a result of changes in circumstances or people, become necessary. Now, any modification in one part of the organization can have wide repercussions and influence the general running of the whole. The chart offers particular facilities for discovering and providing against those repercussions, but it must always be kept up to date. Granted such a condition, it is a precious managerial instrument.

On the organization chart the whole of the personnel is shown, the constitution and demarcation of each department, who is in each position, the superiors from whom an employee takes orders, and the subordinates to whom he gives them, but it cannot be required to show the individual value of employees nor their functions, nor the physical limits of their responsibility, nor who shall deputize for them. For these various facts special lists must accompany the organization chart. The composition of the staff too must be indicated apart from the chart. In the third part of this work I shall give some instances of organization charts taken from actual business practice.

Selection

Selection consists in obtaining the requisite employees for building up the organization, and is among the most important and most difficult of business activities, and exerts considerable influence on their fate. The consequences of bad choice are commensurate with the rank of the employee, viz. relatively

unimportant normally in the case of an operative, but always graver in the case of a higher executive. Difficulty in choosing increases with rank; a few days, sometimes a few hours, suffice to assess a workman's usefulness, but weeks or months are needed to know the value of a foreman and sometimes years elapse before there can be any exact assessment of the value of the head of a large concern. Hence, it is of utmost importance not to err in the choice of higher managers. The question of selection is a matter devolving on business of all kinds, the largest ones especially. The most important duty of a shareholders' meeting is the appointment of the Board of Directors; the chief concern of the Board of Directors is to procure an efficient general management; the selection of employees of all ranks is one of the greatest cares of the executive authority.

A few years back the Comité des Forges started a discussion which revealed how much the industrial world and the public generally were interested in the selection of higher industrial executives. "The number of men," said the President of the Comité des Forges in an open letter addressed to the Minister of Works, "whose clarity and breadth of intelligence, straightness and depth of judgment mark them out for large-scale business management, for starting new businesses and for maintaining France at the level to which her manifest genius has brought her as the pioneer of progress in industrial science and arts despite lack of national resources, has singularly diminished for some years now.

"Our young engineers are, for the most part, incapable of turning the technical knowledge received to good account because of their inability to set forth their ideas in clear well-written reports, so compiled as to permit of a clear grasp of the results of their research or the conclusions to which their observations have led them."

And the President of the Comité des Forges attributed this deplorable state of affairs, at least for the most part, to the new orientation given to post-primary university teaching from 1902 onwards. Undoubtedly the men capable of managing large businesses efficiently are rare and many engineers are incapable of making clear reports, and the fact is sufficiently serious for reasons and remedies to be sought perseveringly.

In my view, these reasons are not to be found in the curricula of post-primary education but in the concentration of industrial units and the manner in which higher technical education is conceived and effected.

Large-scale management has always presented great difficulties. To be aware of them it is enough to glance over the countless different duties laid upon a higher manager. These difficulties are inherent in the nature of things and have existed from all time. But what has not existed from all time is recent industrial development and concentration of industrial units which have considerably increased the proportion of large-scale concerns and thrown into relief the dearth of higher managers.

In substituting one large-scale enterprise for a given number of small or medium ones, concentration of industrial units produces divers effects, contributing to similar results—

1. By bringing into being large organic units it calls for men of wider powers than those previously required.

2. At the same time that it produces the demand for more capable men it abolishes a good number of businesses which might be regarded as training establishments for managers.

3. In medium-sized concerns departmental heads perforce acquaint themselves to some extent with other departments. In large-scale businesses each department is sufficiently important to absorb the time and intelligence of its head and to permit of his attaining a high position which often is the culmination of his career. There again, a group of exceptional men is excluded from the training ground for general management.

Hence there can be little doubt but that concentration of industrial units augments the need for higher managers and renders their training more difficult. In my view, higher technical training could be much more usefully directed to industrial needs than it is at present.

Training of Business Employees

The proportions of qualities and knowledge essential for business employees are a matter of degree, increasingly delicate as the position envisaged is higher and more complex. Each

case calls for special examination. Moreover, however difficult the choice of employees, it is probably not so great as that of their training. The efficient employee—technical, commercial, financial, managerial, or other—is not a spontaneous natural product; for him to be so he has had to have training and this training usually represents long and laborious effort in which home, school, workshop, and State have shared. The question of training of employees is of keen interest in all varieties of enterprise, industrial, commercial, military, political, religious, social. Efforts made on all sides to get good employees and good heads are considerable and comparable. What I am about to say concerning the training of employees in mining and metallurgical industry is broadly applicable to the training of employees in all kinds of industrial concerns.

Training of Employees in the Mining and Metallurgical Industry

A. Place of the School

(i) Higher technical education.

(ii) Post-primary education.

(iii) Primary education.

(i) *Higher Technical Education.* (Misuse of mathematics—length of courses.)

In France higher employees and managers in the mining and metallurgical industry are recruited from various sources, yet they emanate, for the greater part, from the higher establishments of civil engineering (National Higher School of Mines, Paris; National School of Mines, Saint-Etienne; Central School of Arts and Manufacture, etc.). The entrance examination and syllabuses of these schools provide indications of the prevailing trend of thought which governs them.

Let us first note that the classes are almost exclusively technical, that there is no question either of management nor yet of commerce, nor finance, scarcely any of security (in the sense of security of the business), and very little accountancy. Let us add that general education counts for little in the passing out assessment, and that physical and moral qualities do not enter at all. Finally, be it noted that the entrance examination

puts mathematics in a place of preponderating importance.

There is such a discrepancy as between this training and the qualities and knowledge of which engineers and industrial leaders must be possessed, that it is hardly surprising that the result envisaged is not attained. So it is that our colleges of civil engineering seem to be unaware that health and physical fitness are to be reckoned among the most important essential qualities of managers of industrial establishments. The English set more store by them, maybe they go too far. Although taste for sport is appearing in our country, it will be a long time, I think, before we are in danger of going to extremes in this respect, and public opinion has still much to do to induce educational establishments to have enough care for the health and physical fitness of their pupils.

Initiative, drive, sense of proportion, acceptance of responsibility, sense of duty, etc., are so many moral features rendering higher industrial employees of great value. It would be impossible to be either too early or too emphatic in making future managers aware of the importance of these qualities.

General education enjoys no more prestige than does physical culture or moral training in our colleges of civil engineering. Entire attention is directed to technical matters. Nor is this all: since the selection of candidates is primarily on the basis of mathematics, preparatory courses are based largely on mathematics, and there is hardly any place for literature, history, or philosophy.

Now, industrial heads and engineers, save for a few rare exceptions, need to know how to speak and write, but they do not need higher mathematics. It is not sufficiently well known that the simple rule of three has always been enough for business men as it has for military leaders, and it is a false move to sacrifice four of five years' general education in favour of an excess of mathematics. I shall return to this subject later.

Managerial Knowledge

In large industrial concerns the function calling most insistently and directly for the manager's attention is the managerial one (plan of action, selection, organization, and guidance of personnel, co-ordination, control). Immediately

after this come the technical and commercial functions and, finally, with less demand for personal intervention, the financial, security, and accounting functions. The manager's managerial activity is considerable and engrossing.

For a divisional engineer managerial ability is as important as technical ability. This fact may be surprising but is easily explainable thus: the manager of a metallurgical division, for instance, blast furnaces, steel works, rolling-mills, has not for some years been exclusively concerned with metallurgy—or even with a limited section of metallurgy. All details learnt at college about mines, railways, construction, are no longer any more than vaguely useful to him, whereas handling of men, order, planning, in a word, elements of management, are constantly taking up his attention. At the particular level of authority which he has reached the services which he will subsequently be able to render and his own advancement will most likely turn far more on his managerial than on his technical ability. And if he is to attain to higher management, it is not merely management, but commerce and finance too, of which nothing was said at college, and accounting, of which little was imparted to him, which he will have to add to his attainments. It would not be so very difficult to conceive of a training better suited to the end in view. Undoubtedly the engineer needs sound technical training, and must be possessed of general ideas sufficient to enable him to acquaint himself with the technical activities in which he is required to take part, but it is not expected of him in industry to be able to run a blast furnace or sink a mine-shaft or build a machine immediately upon leaving college. Even the best honours man is not able to carry out these activities and will only succeed therein after a more or less lengthy practical introduction. Similar preparation from the managerial viewpoint is just as necessary and lack of it, like lack of adequate notions on commerce, finance, security and accounting, is a serious omission in the training of higher industrial employees.

Contemporary teaching in our higher establishments of civil engineering rests on two illusions: firstly, that the value of engineers and industrial leaders comprises technical ability almost exclusively; and secondly, that the value of engineers and industrial leaders bears a direct relationship to the number

of years devoted to the study of mathematics. The latter is just as dire as the first, and probably will prove more difficult to destroy.

Misuse of Mathematics. That mathematics are one of the most important branches of teaching, and that they are the chief tool of progress in the physical and mechanical sciences, and that all those pledged to industry need more or less extensive knowledge thereof, no one would dream of disputing, but there is a sense of proportion which must not be lost.

Philosophy, literature, natural history, chemistry, are also great factors of social progress, but is this made into a pretext for insisting on several years' compulsory study of each of these branches for our future engineers? Mathematics are misused in the belief that the more there is known of them the better the aptitude for business management and that study of them, more than anything else, develops and corrects judgment. These are errors which are seriously prejudicial to our country and which to me seem worth combating. Where does this misuse originate? To facilitate discussion I shall call "higher" those mathematics not included in the present Matriculation (Baccalauréat) syllabus. This syllabus is part of general university training, over and above it mathematics take on the name of "special," and become in effect a speciality of entrants for the École Polytechnique and colleges of civil engineering. From the point at which young men embark on classes termed "special mathematics" there is, so to speak, no more general education for them, they have started to specialize.

Long personal experience has taught me that the use of *higher* mathematics counts for nothing in managing businesses and that engineers, mining or metallurgical, scarcely ever refer to them. I used to deplore the fact that all our pupils from large schools were subjected to long, futile studies, when there are so many necessary things to be learnt and when industry needs young engineers fit, both physically and morally, and I used to wish that mathematics syllabuses might be curtailed and ideas on management introduced into education.

The Mining and Metallurgical Congress of 1900 afforded me the opportunity of expressing these ideas in public, and following

on my paper the Chairman of the Congress, M. Haton de la Goupillière, made the following pronouncement—

“Gentlemen, your applause shows M. Fayol how unerringly he has sent home his shaft, nevertheless, he will, I hope, allow me some observations, for some defence must be put forward here for mathematics.

“Gentlemen, I began my career with pure mathematics. For twenty years I taught differential and integral calculus as well as mechanics at the School of Mines or at the Sorbonne. As far as concerned the School of Mines, I was imbued with the ideas which M. Fayol has developed for you. I used to give a very curtailed course of calculus which I had reduced to ten lessons and in which I had carefully condensed all that I thought needful to enable pupils to get through the rest of the course. Later I was transferred to classes in mine-working and machinery. The mathematics course was entrusted to a really eminent man (the staff of the School of Mines know whom I mean), a mathematician of the first rank, who felt impelled to give the course quite a different treatment. From that time onwards, the broad scale proffered by my successor has been maintained, but I think that M. Fayol is right and that it would be more appropriate to reduce pure mathematics to what young engineers will need to apply. Anyway, I wish to qualify my approval. It is not merely that the engineer must be capable of performing calculations which, according to M. Fayol, will be almost negligible; he must first pass through the School and the teaching there must, wherever possible, be presented with mathematical accuracy.

“But I think, Gentlemen, that mathematics are an all powerful instrument for training the mind. Once the engineer's mind is trained, set aside mathematics if you will, your pupil will remain no less capable of becoming a great engineer or manager, whereas the same man having gone through less intense mathematics training would never reach the same level. Such is the only amendment which I should care to make to the words of my very eminent and esteemed opponent. I would remind M. Fayol, moreover, that he is in a good position to give all possible weight to his viewpoint, for he is a member of a governing body of major importance, that of the St. Etienne School of Mines. This Board includes, besides the teachers, a

notable number of leading industrialists and surely there could not be found any more outstanding one judged either on industrial importance or loftiness of intellect."

So M. Haton de la Goupillière, mathematician and great teacher, opined that the teaching of mathematics in the Higher School of Mines should be reduced to what was necessary for pupils to pass through the School. My opinion could be upheld by no greater authority. There remains to be settled the point as to whether the study of higher mathematics should occupy several years of future engineers' lives, in the solitary hope of forming their judgment. That the study of mathematics contributes to the formation of judgment, as does any other branch of general education, I firmly believe, but that intensive cultivation of higher mathematics, needlessly inflicted on future engineers, has the same effect, I do not believe at all. Excessive application to any science is bad for physical and mental health and mathematics is no exception to this rule; pursued intensely and at great length it leaves only the most balanced brains unimpaired. There are cases cited of surpassing mathematicians devoid of all practical sense, while men of good sense who are not mathematicians are innumerable.

Auguste Comte has made the observation that mathematical facts are the simplest, least complex, and most "crude" of phenomena, the most abstract, barren and remote from reality in contradistinction to social facts, which are the most complex and subtle.

Were judgment to depend on greater or lesser command of higher mathematics, humanity must long have been devoid of it, and in our own day few people might lay claim to it; barristers, priests, doctors, writers, business men would be bereft of it, together with all the foremen whose sturdy common sense often forms the mainstay of industry, and all the housewives who run their modest homes so wonderfully, would all be lacking in this precious gift of judgment, the sole prerogative of mathematicians! Obviously, no one thinks of upholding such a proposition. The virtue of training is no more reserved to mathematics than to ancient literature; it resides largely in social problems with which life confronts us. Every application of mental powers, every problem of whatever order may contribute to the formation of judgment.

Nevertheless, there is no disputing the fact that higher mathematics enjoy considerable prestige with us. Why is that? It cannot be for their services rendered to industrial heads, for the latter make no use of them. Is it for the services they render to military leaders? Not in that case either. "On the pretext that scientific and industrial progress will be utilized for armed strife between nations," says General Maillard, "it is proclaimed that the conduct of warfare will be entirely scientific and require advanced mathematical knowledge. Nothing is more at variance with the spirit of war. The simple rule of three has sufficed hitherto and will still suffice for solving problems of calculation which present themselves in the course of operations." So the simple rule of three is enough for military as it is for industrial leaders.

If we turn back to the studies which Napoleon was able to make fifteen years before the beginning of last century there is every reason to believe that "the God of War" never used any more complicated formulae. So it is not from that source either that the explanation of our national prestige accorded to mathematics is to be found.

As for engineers of mining and metallurgical establishments, whether they have graduated via the *École Centrale* or the School of Mines or a School of Arts and Crafts, I have never known them use higher mathematics in the course of their work. It is only those who are especially concerned with construction—and they are generally Arts and Crafts Students who have not taken the higher mathematics course—who make frequent use of formulae which are to be found in textbooks. Hence it is superfluous to make the observation that the essential science for higher managers, viz. management, has absolutely nothing in common with higher mathematics.

The only plausible explanation which I have found for the prestige enjoyed by higher mathematics in this country is the following one: The *École Polytechnique* enjoys with us a very great and deserved prestige due to these facts—

1. Positions reserved by the State for pupils of this school in public services and the army, confer considerable influence on them in many large public and private concerns.

2. The intrinsic worth of their pupils.

It is quite natural that intelligent, studious young men should

make considerable effort to qualify for the title "Polytechnician" and to reap its benefits. Parents and educational leaders direct all our intelligent youth towards this objective. And since it is largely on mathematics that entrance qualification and first-class leaving qualification are obtained, the public concludes that mathematics are the science of sciences since it leads to coveted positions, and so effect is mistaken for cause. Mathematics count for nothing, or almost nothing, in the renown attaching to the École Polytechnique; such renown derives from privileges reserved by the government for pupils from this college and from their own natural intrinsic worth.

Without such privileges the college's prestige would quickly have vanished, for mathematics are not its mainstay. If, on the other hand, whilst maintaining these privileges, the entrance and leaving examinations had mathematics placed on the same footing as chemistry, geology, physical training and if, furthermore, the ability to speak and write well were accorded pride of place, the college would be just as sought after as formerly, and the greater part of its students would be no less competent to fill the posts reserved for them, but higher mathematics would straightway have forfeited all its prestige.

Drawn from among the intelligent children of the country as a whole, the students of the École Polytechnique undoubtedly constitute an *élite*, but would it be any the less an *élite* without the excess of mathematics to which they are subjected? Is it quite certain that this training is not harmful, rather than useful to them?

The question should be put as to why higher mathematics, which managers do not use, and which are of small service to engineers and managers, and which have little or rather ill effect on judgment when young students are overburdened with them, have remained in the forefront of the entrance syllabus and passing out assessment of the École Polytechnique. I am grieved to state that general opinion attributes this practice to the facility of assessment which mathematics afford to examiners.

Howsoever maybe, I sincerely trust that the École Polytechnique will curtail its mathematics curricula so that letters may have greater place and that management may not be forgotten. I am convinced that its prestige would lose nothing

in the process and our establishments of civil engineering which feel obliged to follow suit would then stop inflicting useless and consequently harmful examinations on their entrants and students.

Length of Courses. I said to the Congress of Mines and Metallurgy in 1900—

“Our future engineers stay too much at their school desks. Industry which needs healthy, adaptable, unassuming young men and (I would say) full of illusions too, frequently gets weary engineers, listless in mind and body, less ready than could be desired to accept humble tasks and to put forth those fine efforts which make everything easy. I am convinced that they could be given over to active life at an earlier date and just as well prepared were useless teaching to be eliminated.” From 1900 onwards my opinion on the excessive length of engineering studies has merely been confirmed. I consider that four years are largely adequate to turn a good post-primary school pupil into an engineering college graduate. The young engineer can be ready to enter industry at twenty-one or twenty-two, and at such an age can be useful. This result should be achieved even whilst devoting six months to classes in management, commerce, finance, security, accounting, subjects which are lacking to-day in our important schools. Therefore at least two years of the time spent on higher mathematics and certain useless details of technical courses must be saved, and I am convinced that this can be done in preparing civil engineering students for their industrial future much better than they are prepared at present. There remains to be settled the question of military service, which I do not consider necessary to treat of here.

No amount of care could be too much in the training of these young men on whom the country's industrial future largely depends, and it is this reflection which has prompted me to set out here some advice which, were it within my power, I would freely bestow upon them at the moment of their leaving their college desks.

Advice to Future Engineers. You are happy in the thought that you are going to be of use at last and you have the legitimate desire to win an honourable place by giving your service. The qualities which you will have to call into play are not

precisely those which confer front rank at college. Thus health, the art of handling men, and bearing, which are not assessed in examinations, have a certain influence on an engineer's success. Circumstances, too, vary, so there is nothing surprising in the fact that the first class or even highest of their year are not always those who do best. You are not ready to take over the management of a business, even a small one. College has given you no conceptions of management, nor of commerce, nor yet of accounting, which are requisite for a manager. Even had it given you them, you would still be lacking in what is known as practical experience, and which is acquired only by contact with men and with things.

Nor are you ready to run a large technical department straightaway. No industrial leader would be rash enough to entrust you immediately with the sinking of a mine-shaft or the running of a blast furnace or rolling-mill. First you must learn the trade which you do not know. So, like most of your predecessors, you will start as an assistant engineer or even lower down. Mature judgment is not expected of you nor practical acquaintance with technical processes, nor wide grasp of the thousand and one details impinging more or less on your job. But you will be expected to bring, along with your diploma, thoughtfulness, logic, an observant mind and loyalty in the accomplishment of your task. The theoretical knowledge which you possess will permit you to assimilate quickly all details of any kind of work whatsoever.

Your future will rest much on your technical ability, but much more on your managerial ability. Even for a beginner knowledge of how to command, plan, organize, and control is the indispensable complement of technical knowledge. You will be judged not on what you know but on what you do and the engineer accomplishes but little without other people's assistance, even when he starts out. To know how to handle men is a pressing necessity.

At first, you will have as immediate subordinates foremen, former workers mostly, chosen from among their fellows in virtue of their intelligence, conduct, and ability to command. They have experience of workmen and workshops which you lack, and they are well aware of it. They know, too, that you are relatively quite learned and have a wholesome respect for

science. Therein lie the foundations of tacit understanding which should grow up between you. Do not forget that the foreman stands for countless years of experience and judgment developed by daily use and remember that from contact with him you can acquire valuable, indispensable, practical data, an essential complement to college training.

Maintain towards workers a polite and kindly attitude; set out to study their behaviour, character, abilities, work, and even their personal interests. Remember that intelligent men are to be found in every walk of life. With capable leadership there is obtained not merely discipline but loyalty of every kind, which may, in difficult or dangerous circumstances, reach abnegation and sacrifice of self. In working relationships measure your words carefully and give expression to no undeserved reproof. Do not hesitate to acknowledge openly, should occasion demand, that your remark was based on an inexact interpretation of facts or rulings. Make an effort to earn your superior's good-will by well-directed keenness in carrying out your work; he will then be kindly disposed towards you and you must not abuse this. Bring suspension of judgment and sense of proportion to bear upon your assessment of things and people around you. To use criticism with the idea of contributing to improvement is good, but criticism of any other kind is an act of levity or malevolence. Have confidence in yourself without falling into presumption. It is not a case of despising or ignoring the opinions of others, but one should know how to defend one's point of view with confidence and enthusiasm, when one knows one's subject and is sure of oneself. You will have difficulty in convincing others if you yourself are unconvinced.

Your professional work will not entirely consume your time; you will always find the time required for study. Aim at perfecting your professional knowledge, but do not neglect your general education. Those superiors who most inspire your esteem and admiration, you will find, have, by the exercise of unremitting effort, never stopped learning. Be sure that there is much to be learnt around you and that everything is of interest provided that you put yourself to it. Take note of things as they present themselves to your mind; if you file them methodically you will find before long that you have thus

performed a useful work. Doubtless, if you are fond of your work, you will come across questions which will attract you and you will want to fathom. Give up your spare time to them; seek out what others have done in the same subjects, and see whether they have not left some problem or other to be solved. Knowledge will not come to you solely from the performance of your daily tasks; learn from books, periodicals, and personal effort, otherwise you will reap merely disappointment. Be a subscribing member of the main technical societies dealing with your specialized work, follow their meetings and attend their conferences. Thus you will come into contact with the eminent men of your profession. Try, as early as possible, in a modest way to publish notes on the subjects which you have studied so that you will be able to give and take the measure of your ability.

Enjoyment of good health is an essential condition for the making of one's way in the world, so care must be taken of health. Do not exceed the limits of your own strength and to this end combine physical training and mental exercise. It may happen that, in critical circumstances, you may have to sustain intensive work, by day and night, up to a point of exhaustion. A brief rest will restore your faculties to normal, but bear in mind that excess of work is at times as dangerous as other forms of excess. When the brain is tired and no longer obeys, then it is time to relax. Never to take a holiday is an undesirable habit; one's personal output will suffer both as to quantity and quality.

Be bold and enthusiastic as befits youth, and never give way to discouragement. When one has put one's best into one's work and borne weariness and discomfort to bring it to conclusion, one's pains are rewarded. Be enterprising, even daring; fear of responsibility is an index of weakness. Do not forget that all intelligence, effort, and ability devoted to the success of an enterprise may come to nought; circumstances sometimes exert a great influence on business success and consequently on the success of those at the top. But the rôle of luck must not be over-rated; he who succeeds a first time may be just lucky, but if his success is repeated it has to be acknowledged that the measure of his personal worth occupies chief place in success.

You belong to the intellectual élite, so you may not remain

indifferent to current affairs and you should be aware of general trends of thought motivating every sphere of modern society. Your duty is not merely to yourself, but also to your colleagues, superiors and the firm which you serve; your bearing, attitude, remarks and conduct should show that you are precisely aware of your responsibility. Finally, do not lose sight of the fact that marriage is the most important act of civic life and that on that act hangs much of life's happiness and success in a career, and that you should make every effort to be worthy of a good helpmate and make a choice worthy of yourself.

(ii) *Post-primary Education*

Post-primary education of the secondary schools (lycées) has as its object general education and its criterion the Matriculation examination (Baccalauréat). It is not a preparation for any special career and its pupils are less well equipped than are primary-school ones for the lower posts of industry, nor are they at all equipped for the higher ones. They are a sort of intermediate product needing further processing before being suitable for use.

For future engineers this processing is done in the higher technical colleges where candidates enter after a year or two's special preparation. If this preparation is not all that it should be, either from the standpoint of national needs or from that of the future of youth, it is not for the secondary school to bear the blame but the higher technical college, which determines conditions of entry. The secondary school submits to the syllabus for preparatory courses but is not responsible for it. On the day when higher technical colleges require less mathematics of their entrants and more clarity of expression and some management, the secondary schools will then bring their teaching into line with the entrance syllabuses, and I hope that this day is not too far off.

(a) *University Education.* University post-primary education does not envisage industry directly because its students are spread over widely different careers—medicine, law, teaching, agriculture, business colleges, the army, etc. Now has the university given all these young men the general education which they were entitled to expect before they started to specialize?

From the industrial viewpoint the Comité des Forges has answered, No! and lays the burden of responsibility on the curricula adopted in 1902. Some other representatives of social interests have uttered contrary opinions, but most have said nothing.

I do not believe that everything is for the best in university post-primary education, and I am quite convinced, for instance, that, if the managerial rules of unity of action, co-ordination, and control were better observed in the planning of studies, results would be better. But those are not questions of curriculum and I do not think that the syllabuses of 1902 account for many of the ills under complaint. From this standpoint post-primary education seems to me less defective than higher technical training, and in my view it is towards this latter point that effort should be primarily and chiefly directed.

(b) *Specialized Education.* The middle ranks of employees which industry does not find among post-primary university students, are recruited largely from the increasingly numerous and growing specialized training establishments, instituted specifically to qualify good foremen and superintendents. Building, mining, metallurgy, agriculture, chemistry, electricity, textiles, have their specialized training schools, local or regional, whence each year there emerges an army of good men. As the general result of a selection process operating during the course of primary education, this body of young people constitutes an élite well equipped for the service of industry. A certain number of them become managers of businesses, and some reach the highest industrial posts.

Hitherto management has formed no part of the syllabuses of these post-primary technical establishments and this is a regrettable omission. The students of these establishments, destined to become managers, ought to have fairly wide conceptions of the art of planning, organizing, co-ordinating and control.

(iii) *Primary Education*

No one doubts that a good primary education is an excellent preparation for industrial work. Before the State had taken over primary education, large firms generally had their own schools and since that time they have not ceased to

take an interest in this education. They come into it either by conferring privileges on the best students or by making grants for setting up advanced or specialized courses, or else in some other way.

To-day, mining and metallurgical workers have as much, if not more, instruction than had on an average the foreman or master miner of fifty years back. The result is considerable but still far from full possibilities. I believe that it would be good to bring a few ideas about management into primary education. A couple of pages of written matter and some diagrammatic charts would suffice to sow in children's minds the germ of ideas which would develop naturally as time went on.

B. Place of the Workshop (employer)

When he has first left school, the industrial worker is merely an apprentice, workman apprentice, foreman-apprentice, engineer-apprentice, manager-apprentice. Even if he has specialized in his studies his training is still incomplete, for he lacks experience of the industrial milieu wherein the human factor and commercial struggle have an importance of which it is difficult to give a precise idea at school. School education needs some complement, so that where the school's rôle ends that of the workshop should begin.

The employer's educational responsibility should operate at all levels and be constantly on the alert. Abilities must be found out, effort encouraged, initiation and training made easier, keenness and success rewarded, and selection constantly maintained. Thus is a good personnel built up.

To whatever grade he belongs, an employee so trained from the inside is better able to fulfil his duties than one introduced from outside. Even in promoting employees of known ability there is no guarantee against disappointment, but how much more is one exposed to it in engaging them from outside, in spite of shielding oneself with every precaution! For the technical training of employees of all ranks there are almost identical customs in all similar concerns, customs deriving from scientific theory and from experience. To learn, an employee has but to keep his eyes open, use his brain, and do his best to fulfil his duties efficiently. It is not quite the same in the case of

management training. Lack of standard practice gives rise to hesitation and contradiction in which it is often difficult to discern any other factor but the overriding will of the manager.

A sign of good management is the steady, methodical training of all employees required and at all levels. A few years' competent effort in this connection can yield wonderful results. Conversely, it does not take long for misguided management to nullify the value of a good personnel, particularly its managerial value.

If the manager preaches by example in introducing his subordinates as much as possible to the general problems of management, if he prevails upon the engineer to instil a little science into the foreman in exchange for experience, and gets the foremen to try and teach the workers, there is every chance that the concern will soon rejoice in a fine personnel.

C. Place of the Home

Like any other enterprise, the home has to be managed, i.e. it needs foresight, organization, command, co-ordination, and control. The family could be an excellent school for management; principles, procedures, methods, penetrating naturally into children's minds, would lay the foundation of general ideas which might be perfected and handed on later. It is nothing of the sort. Each one thinks that his ideas on the subject are adequate and follows his bent or lets things take their own course. From the managerial standpoint the home affords the most varied examples ranging from best to worst and that continues without any appreciable improvement. Only a theory formally taught and then submitted to general discussion can put an end to this general groping prevalent in the isolation of our households. Then only will the home play the part which befits it in the management training of youth.

D. Place of the State

The State can contribute to the managerial training of its citizens through its schools and by its own example. We have noted that State schools have hitherto neglected management teaching almost entirely. In this connection everything yet

remains to be done. As for examples drawn from the State, like those from home and workshop, they are different in kind and in value. In the main national services, planning, organization, command, co-ordination, control, are only within reach of picked brains reinforced by business experience. Now the present system of selection frequently brings to power men who are strangers to business and unprepared or hardly prepared for the difficult duties suddenly vested in them. In such conditions management is necessarily patchy; good, even very good, perhaps at times, but not calculated to constitute managerial training for citizens. I think that sound management teaching could improve this situation.

3. COMMAND

The organization, having been formed, must be set going and this is the mission of command. This mission is spread over the different heads of the concern, each in charge of and responsible for his particular unit. For every manager the object of command is to get the optimum return from all employees of his unit in the interest of the whole concern. The art of command rests on certain personal qualities and a knowledge of general principles of management. It shows up in small, as in large, concerns and like all other arts has its degrees of proficiency. The very large unit which functions properly and gives its maximum return inspires public admiration. In every sphere, industrial, military, political, or other, command of a large unit calls for exceptional qualities. I shall confine myself to recalling a few precepts intended to facilitate command. The manager who has to command should—

1. Have a thorough knowledge of his personnel.
2. Eliminate the incompetent.
3. Be well versed in the agreements binding the business and its employees.
4. Set a good example.
5. Conduct periodic audits of the organization and use summarized charts to further this.
6. Bring together his chief assistants by means of conferences, at which unity of direction and focusing of effort are provided for.

7. Not become engrossed in detail.

8. Aim at making unity, energy, initiative and loyalty prevail among the personnel.

(i) *Thorough Knowledge of the Personnel.* Faced with a great unit numbering hundreds or thousands of workers the problem seems insoluble at first sight. But the difficulty is made considerably easier by the particular institution of the organization which arises from the existence of this very difficulty. Whatever his level of authority, one head only has direct command over a small number of subordinates, less than six normally. Only the superior S¹ (foreman or his equivalent) is in direct command of twenty or thirty men, when the work is simple. So it is not impossible for the manager, even in a large-scale concern, to make a study of his immediate subordinates and succeed in knowing what he may expect of each of them, and what degree of confidence he may place in them. This study always demands some time and is increasingly difficult as the subordinates are higher in rank, as their functions separate them increasingly from each other, and as contacts between superiors and subordinates are infrequent, as does sometimes happen at the top level of a large business. It cannot be achieved where there exists no stability of tenure among higher personnel. As for indirect subordinates, that is to say, those who level by level extend down to the base of the pyramid whose apex is the manager, and those on whom his action is only operative via intermediaries, it is obvious that his knowledge of them decreases as their number increases. That does not absolutely rule out all direct personal action, that of example among others.

(ii) *Elimination of the Incompetent.* To keep his unit in good running order the manager must eliminate or suggest elimination of any employee, who for whatsoever reason has become incapable of carrying out his duties. It is an imperative duty, always onerous and often thorny. Consider, for instance, the case of an old servant in a high position, esteemed and liked, who has given yeoman service and whose faculties, unbeknown to him, are waning to the point of impeding the working of the business. Elimination has become necessary, but who is to be judge of this necessity and who charged with determining the precise moment for action?—the manager alone, where

there is no principle or ruling to cover him. The recollection of services rendered, affection, the inevitable repercussions, incline him to postpone a step which will surprise and deeply distress a respected and loyal employee, and only the common good, of which the manager is judge and steward, requires it without delay. Duty is laid down for him and must be ably and courageously carried out, which is no mean task.

The entire body corporate feels the effect of the amputation of one of its members, and an important member at that, and the sense of security of each of the other employees will be disturbed also and his confidence in the future, and consequently his keenness will be lessened unless there was the conviction that it was a just and necessary action. This conviction has to be imparted.

The concern will have provided against this kind of eventuality by means of financial compensations, non-financial rewards or light duties, permitting some active work to be kept up. The able and kindly manager finds in such expedients and in his own feelings the means of salving wounds inflicted of necessity on pride and on interest, and at the same time finds occasion for reassuring all members of the staff as to their future. From this example it is seen that elimination of incompetent members of the personnel calls into play the manager's highest attributes and in particular a certain civic courage, harder to display sometimes than soldierly courage.

(iii) *Thorough Knowledge of Agreements Binding the Business and its Employees.* An enterprise and its employees are bound together by agreements and the manager must see that such contracts are carried out. That imposes a dual rôle on him, viz. defending the interest of the business as against its employees and the interest of employees as against that of the employer. A business is open to manifold assaults, arising maybe from the desire for more pay or for less work, or else from counsels dictated by laziness, vanity, weakness, and other human feelings. The most dreaded from among these assaults are those deriving from the head himself, when he is forgetting that the interest of the concern as a whole should be the sole criterion of his conduct and that he should studiously avoid anything savouring of favouritism involving family, fellow-workers, or friends. To fulfil this first part of his rôle he must have

integrity, tact and drive and, to protect the personnel against possible abuses on the employer's part, he must have very full knowledge of the agreements and a strong sense of duty and of equity. But constant intelligent adherence to agreements does not free him from obligations of conscience. Be they good or bad agreements they do not last for ever, and there always comes a time when they are no longer attuned to current economic or social conditions, so change must be taken into account or else the risk will be run of some day reaching a formidable conflict. None is better placed than the manager of his unit for adhering to agreements and for recommending and carrying out, if he has the power, modifications made necessary by times and circumstances.

(iv) *The Manager's Good Example.* It is taken for granted that every manager has authority to exact obedience, but a business would be ill-served were obedience obtained only by fear of repression. There are other ways of achieving a discipline more productive of spontaneous effort and considered initiative. Some leaders get obedience, energy, zeal, and even loyalty without apparent effort; others never succeed at it. One of the most effective methods of training is example. When the manager sets an example of hard work no one dare arrive late, when he is active, courageous and loyal he is imitated and, if he knows how to go about it, will succeed in making work enjoyable. But bad example, too, is contagious, and in coming from above it has more serious repercussions on the unit as a whole. That is one of the countless reasons which make a good manager so desirable.

(v) *Periodic Audit of the Organization.* It would be most improvident not to make periodic inspections of all parts of a machine, especially a complex one. There would be risk of poor output, accidents, even catastrophes. Daily (somewhat superficial) inspection is no adequate guarantee. No less great is the need for periodic overhaul of administrative machinery, but it is much less widely practised. The reasons are many—

Firstly, there is no clear decision as to the form to be adopted. Whilst it is clearly understood what an organ or machine part should be like when in proper running order, there are seldom very precise ideas as to what the organ operating a function or one element of such an organ should be like. Different and

varying forms have become accepted, and repair work outstanding does not appear with clarity. Besides, that which touches personnel usually demands more time, skill, and moral vigour than does a concrete task. In matters of personnel a sense of high moral responsibility irreconcilable with managerial lack of permanency must be at the foundation of reform. So it is wise to have a rule which automatically, so to speak, requires periodic overhaul of the organization. The following rule meets this need—

“Every year, in connection with the drawing up of the annual plan, a scrupulous study of the constitution of the organization is to be made with the assistance of summarized charts.”

Such charts indicate the scalar chain of managerial staff of the concern and show each man's immediate superior and subordinates, and are a kind of photograph of the framework of the concern at a given moment. Five charts, made up at different dates, will show modifications in the composition of the organization in the interval between such dates and so are invaluable for periodic audits, and no less so for current use, in order to avoid faulty arrangements proceeding all too frequently out of hasty organic modifications. These flaws in organic structure, difficult to appreciate from description, leap into view on a chart which acts as a gauge which will not pass any defective shape. Moreover, the charts render great service in the matter of unity of command, for it is known that dual command is the source of very many conflicts, and dual command often creeps into the personnel by way of small organizational defects which charts throw up, and so permit of their avoidance. Summary charts of personnel, kept constantly up to date, form part of the procedures to which the manager of a unit, especially of a large unit, constantly has recourse.

(vi) *Conferences and Reports.* In a conference which gathers together his chief direct assistants around him, the manager may explain a programme, garner each one's ideas, make a decision, make sure that his orders are understood, and that each one knows his share in their execution, and all in a tenth of the time that it would have taken him to arrive at the same result without conferences. It may even be said that if these

assistants are important departmental heads, without frequent contact between them and their chief—as is often the case in very large businesses—it is not possible, apart from conferences, even at the cost of much time and trouble, to obtain that surety and strength which the conference can yield.

The manager must know all that goes on, either from personal contact, as in the case of the small unit; indirectly, as in the large one; verbal and written reports are the complements to supervision and control which he must know how to use.

(vii) *Do not Become Engrossed in Detail.* A serious defect for a higher manager consists in devoting much time to details which subordinates could attend to as well as, if not better than he, whilst important problems await solution because he cannot manage to find time to see to them. There are some people who think themselves very useful if they deal with the minutest details in person, others who cannot get used to the idea that a thing can be well done if they have not had a hand in it, and this way of thinking leads some of them to leave matters in abeyance during their absence. Discounting the opinion of those who consider that a higher manager must always have a busy air about him, a manager should always seek to retain for himself that liberty of thought and of action necessary for the examination, direction, and control of main business issues. He should off-load on to his subordinates and general staff all the work which he himself is not strictly bound to perform. There will never be too much time and energy left him to devote to such questions as are constantly claiming his personal attention. Not being engrossed in detail does not mean that it must not be looked to; a manager should be aware of everything, but he cannot do everything nor see everything, and the care lavished on small matters should not result in his neglecting the large ones. Good organization provides for that.

(viii) *Aim at Making Unity, Energy, Initiative, and Loyalty Prevail among the Personnel.* The manager can make great contribution towards unity of personnel by brushing aside the seeds of dissension which might be engendered by dual command, functions ill-defined, unmerited reproof, and so on. He can develop initiative among his subordinates by allowing them the maximum share of activity consistent with their position

and capability, even at the cost of some mistakes, whose magnitude, however, may be circumscribed by means of watchful attention. By showing them discreetly without acting for them, by encouraging them with appropriate praise, by sometimes sacrificing his own personal vanity for their benefit, he can quickly transform men with latent abilities into employees of the first water. By seeing, too, that the same thing is done at all levels of authority, he can quickly improve the personnel as a whole and render the concern great service.

On the other hand, an aloof and half-attentive manner of reception, rejection, or indefinite postponement of every proposal put forward is not long in drying up initiative and loyalty at the source. Not very much time is required for changing, either for good or for ill, the attitude of the personnel, through able or misguided management.

Many other counsels might or may be added to the foregoing ones. They are so many means singled out by experience as being by nature capable of facilitating a manager's task. But it must not be forgotten that the best instrument does not dispense with the player who uses it.

4. CO-ORDINATION

To co-ordinate is to harmonize all the activities of a concern so as to facilitate its working, and its success. It is giving to the material and social, functional, organic whole such proportions as are suitable to enable it to play its part assuredly and economically. It is to bear in mind in any activity whatsoever, technical, commercial, financial or other, the obligations and consequences such action involves for all the functions of the business. It is to keep expenditure proportionate to financial resources, equipment and tools to production needs, stocks to rate of consumption, sales to production. It is to build the house neither too small nor too big, adapt the tool to its use, the road to the vehicle, the safety precautions to the risks. It is to relegate the secondary to second place after the principal. It is, in a word, to accord things and actions their rightful proportions, and to adapt means to ends.

In a well co-ordinated enterprise the following facts are to be observed—

1. Each department works in harmony with the rest. Stores knows what has to be supplied and at what time; Production knows its target; Maintenance keeps equipment and tools in good order; Finance procures necessary funds; Security sees to the protection of goods and persons, and all these activities are carried out in sure orderly fashion.

2. In each department divisions and sub-divisions are precisely informed as to the share they must take in the communal task and the reciprocal aid they are to afford one another.

3. The working schedule of the various departments and sub-divisions thereof is constantly attuned to circumstances.

Such result demands intelligence and experienced, active direction. It must be conceded that these three requirements are not always fulfilled, for in some concerns the following signs of unmistakable lack of co-ordination are apparent—

1. Each department knows and wants to know nothing of the others. It operates as if it were its own aim and end, without bothering either about neighbouring departments or the business as a whole.

2. Water-tight compartments exist between the divisions and offices of the same department as they do also between different departments. Each one's prime concern is to take cover from personal responsibility behind a piece of paper, an order or a circular letter.


3. No one thinks of the general interest; initiative and loyalty are non-existent.

This attitude on the part of the personnel, so disastrous for the concern, is not the result of pre-concerted intention but the culmination of non-existent or inadequate co-ordination. A good personnel will not take long to be weakened if it is not constantly reminded of its duties towards the firm and towards all members of the body corporate. One of the best methods of keeping the personnel in trim and making the execution of its duties easier is the conference of departmental heads.

Weekly Conference of Departmental Heads. The conference of departmental heads has for its aim to inform management about the running of the concern, to make clear co-operation to be expected as between various departments, to utilize the presence of departmental managers for solving various problems of common interest. In such conferences it is not a case of drawing up

the plan of action of the business, but of facilitating the carrying out of this plan in the light of current events. The scope of each conference extends over a short period only, normally a week, during which the harmonizing of activity and focusing of effort are to be ensured.

Here, by way of example, is the practice followed on this point which has yielded excellent results in the various establishments of a large mining and metallurgical enterprise. In each establishment, mine or works, all departmental heads meet once a week, on a given day, under the chairmanship of the general manager. Each departmental head indicates how his department is running, difficulties met with, help needed, and solutions suggested. The general manager invites everyone's opinion on all questions which arise or which he himself brings up, and after discussion a decision is taken. It is to be understood that no point shall be omitted from the agenda simply by being forgotten. Minutes are kept of each meeting and read out at the beginning of the following one; these are usually kept by a secretary, who is not one of the departmental managers. The meeting always takes place on its appointed day even if the general manager cannot be present. In that case, he is represented by a deputy appointed beforehand. The conference brings together heads of production or extraction, selling, maintenance, buildings, etc., and thanks to the pooling of abilities, the general manager can bring a breadth, precision, and speed otherwise unobtainable, to bear on the examination of each point. In a relatively short time—about an hour—the general manager is informed as to the general run of things, and can make decisions touching various departments simultaneously, and can be explicit as to how different departments are to help one another. Each departmental head goes away knowing exactly what he has to do and in the knowledge that he is to return in a week's time to give an account of what he has done. Such cohesion could not be obtained without conference even if ten times more time and effort were to be expended.

Therefore, the general manager takes great care of this precious instrument and makes preparation for the conference by noting beforehand the matters to be dealt with and supervises the drawing up of the minutes.  He makes all necessary

effort to have discussion always on courteous terms and of interest to all. A well-managed meeting is always of use but certain gifts are needed, or it may remain dull, boring, and fruitless. Other things being equal, moreover, the general manager capable of making good use of conferences is much superior to the one who cannot do so.

Experience has shown that a co-ordinating conference once a week is enough for mining or metallurgical establishments counting several hundred or thousand employees, and observation has convinced me that a weekly meeting is just as suitable for businesses of any kind having a labour force of similar magnitude to those mentioned. I think that the weekly meeting of departmental heads is indispensable for purposes of co-ordination in the case of very large units, ministries, and the government proper, and I myself would make it a binding obligation for all concerns.

Liaison Officers. For the conference to be held, however, there must be no obstacle, distance, or any other, to the assembling of departmental heads. If it is merely a case of difficulty the meetings may be held at longer intervals, but if it is impossible the gap must be filled as far as possible by the use of liaison officers at meetings. The best liaison officer would be the general manager visiting all departmental heads in turn, but the weight of his responsibilities does not usually permit of such mobility, so recourse must be had to other employees who will be, depending on the circumstances, either men of special ability or ordinary employees. Liaison officers are generally part of the staff, whose responsibilities and functions we have already considered.

In large-scale concerns comprising several separate establishments remote from each other, co-ordination is effected by combined action on the part of general management which supervises the whole, plus local managements whose efforts are directed towards the successful working of each particular part. There too, more than in the case of the single establishment, is it important to turn the strength afforded by co-ordination to good account.

To establish harmony as between the various parts of the material or social organism of a large concern, viz. between its technical, commercial, financial potentials and its various

activities, not only are a good plan and a good organization required but also continuous co-ordination. All the forces in play must be kept in equilibrium, and a sudden disturbance threatening the running of the whole occasioned by application of some measure at one point only must be avoided. No procedure is better than the conference for ensuring unity of direction and focusing of efforts, for producing spontaneous collaboration on the part of different departmental heads called upon to pursue a common aim. The water-tight compartment disappears when all departmental heads have to give an account of themselves, and be in agreement in the presence of a higher authority.

The co-ordinating conference is to co-ordination what the plan of action is to foresight, what summarized charts of personnel are to the human organization; it is a characteristic sign and essential instrument. If the sign is missing there is a good chance that the function is badly carried out but the presence of such a sign is no absolute guarantee of smooth working and in addition the manager must know how to use the instrument properly, and the art of manipulating these various instruments is one of the qualities required of the manager.

5. CONTROL

In an undertaking, control consists in verifying whether everything occurs in conformity with the plan adopted, the instructions issued and principles established. It has for object to point out weaknesses and errors in order to rectify them and prevent recurrence. It operates on everything, things, people, actions. From the management standpoint it must be ensured that a plan does exist, that it is put into operation and kept up to date, that the human organization is complete, the summarized personnel charts in use, and that command is exercised in line with principles, that co-ordinating conferences are held, etc., etc.

From the commercial standpoint it must be ensured that the incoming and outgoing materials are checked for quantity, quality and price, and that stores records are properly kept and promises honoured.

From the technical standpoint the progress of operations

must be noted, their results and inequalities, also maintenance and condition of plant, the working of men and machines.

From the financial standpoint control bears upon books and cash, financial resources and requirements, use of capital, etc.

From the security standpoint the procedures adopted for protecting property and persons in good working order must be ensured.

Finally, from the accounting standpoint it must be ensured that essential documents come quickly to hand, give a clear picture of the condition of the business, and that control finds in books, statistics and diagrams adequate elements for auditing purposes and that there is no useless document or set of figures.

All these operations spring from supervision just so long as they can be carried out by the head of the business and his assistants along the scalar chain. In a metallurgical concern, for instance, the ore going into the works has to be received by the technical department, processed products are submitted for inspection to the commercial department before being marketed. Each department supervises its own employees, whilst higher authority keeps an eye on everything. But when certain control operations become too numerous, or too complex, or too widespread to be carried out by ordinary employees of various departments, recourse must be had to special people called controllers or inspectors.

Since I am here only concerned with management, I am not going to dwell on the control operating over the different concerns which, since it usually relates to receiving goods, is a matter for the commercial department. I have in mind specifically internal control whose object is to contribute to the smooth working of each department in particular and of the concern in general.

For control to be effective it must be done within reasonable time and be followed up by sanctions. It is quite obvious that if the conclusions derived from checking activities, however efficient, come to hand too late to be of possible usefulness, then control will have been a futile activity. It is no less clear that control is useless if the practical outcome of it is wilfully neglected. These two mistakes are those which good management does not allow to be made.

A further danger to avoid is infiltration of control into management and departmental running. This encroachment makes for duality of management in its most formidable aspect : on one side there is irresponsible control, but capable at times of doing widespread harm ; on the other is the operating department, bereft of all but weak means of defence against hostile control. The tendency to encroach on the part of control is fairly common in large-scale affairs especially and may have most serious consequences. To offset it, powers of control must be defined at the outset as precisely as possible with indication of limits not to be exceeded, and then higher authority must watch carefully the use which control makes of its powers.

Knowing the objective and the conditions in which control is to be exercised, we can deduce therefrom that the good inspector should be competent and impartial. The competence of the inspector needs no demonstrating, for to be judge of the quality of a thing, the value of a manufacturing process, the clarity of the written word, the means of command employed, there must obviously be adequate competence present in each case. Impartiality rests on an upright conscience and complete independence of inspector vis-à-vis the person or thing inspected. Control is suspect when the inspector is in any way dependent on the person under inspection and even when the two are linked too closely by considerations of interest, relationship or friendship.

Such are the main conditions which the inspector must fulfil ; they embrace competence, sense of duty independent of the person inspected, judgment and tact.

Properly carried out, control is a precious auxiliary to management and can afford it certain necessary data which official supervision might at times fail to furnish. It can operate on everything and it depends on management whether it functions effectively. A good system of control provides against undesirable surprises, capable of degenerating into catastrophes. It is as well always to be able to give an answer *à propos* of no matter what activity to the question "How is control effected?" Being applied to all kinds of activities and employees of all grades, it operates in a thousand different ways. Like the other elements of management, foresight,

organization, command, and co-ordination, it demands constant and sustained attention and often a good deal of art. I shall have occasion to cite some examples in the third part of these studies.

* * *

In the first part of these studies I have sought to establish the necessity and possibility of management teaching; in the second, I have indicated what this teaching might be; in the third, I shall show how I have amassed, in the course of a long industrial career, the material for this work, and in the fourth, I shall draw from recent events fresh proofs of the usefulness of teaching of management.

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a little music, read good poem,
see a fine picture and, if possible,
speak a few reasonable words."

- " Goeth " -

